ARCHIVES OF OTOLOGY.

HISTORY AND AUTOPSY OF TWO CASES OF FATAL OTITIC BRAIN DISEASE.

I.—A TYPICAL ABSCESS IN THE TEMPORO-SPHENOIDAL LOBE.
II.—AN ACUTE OTITIC RETRO-PHARYNGEAL ABSCESS WITH PURULENT LEPTO-MENINGITIS OF THE CONVEXITY OF THE ANTERIOR LOBES.

By H. KNAPP.

(*With two chromo-lithographic plates, Tab. A, B, and a figure in the text.*)

THE publication of the two subjoined cases, of which I am enabled to furnish two good colored drawings of early autopsies, may not be without interest at a time when the surgical treatment of otitic brain affections is so zealously and successfully cultivated.

I.

The first case represents *a typical abscess in the temporo-sphenoidal lobe.* It was caused by chronic suppuration in the middle ear, and ended fatally by cerebral pressure from a large abscess without any further complications. The autopsy made it appear quite probable that the patient might have been saved if the abscess had been evacuated even a week before death.

The patient, G. A. N., was a young physician of New York. Had suffered since childhood from chronic bilateral otorrhœa, for which he had been treated with trichloracetic acid for several years. Since Oct. 19, 1894, he was under the care of my former pupil and assistant, Dr. J. B. McMahon, who removed polypi from the left ear. The patient had intense general headache ; no nausea. The further treatment consisted in cleansing

the ear, instillation of a weak alcoholic solution of boric acid, and touching of the granulation tissue with chromic acid.

Nov. 12th.—Dr. McMahon was sent for. The patient had been in bed for two days. Intense headache. Drowsiness. No vomiting. No tenderness on pressure. Takes food. Stools regular. Pulse, 72 ; resp., 16 ; temp., 99.3° F.

Nov. 14th.—About the same. Temp., 99.7°.

Nov. 15th.—Pulse, 60 ; resp., 18 ; temp. 98.6°. Granulation tissue scraped out with a sharp spoon. Marked stupor. Questions answered with difficulty. No pain. Pupils and fundi occ. normal.

I saw the patient in consultation with Dr. McMahon on the evening of November 16th. He lay in bed, apathetic, did not answer, moved his hands only when his ear canal was cleansed with the cotton-holder. The pupils were equally wide and reacted well on a point of light being thrown into them from either side. Fundi normal. He had very intense headache, nausea, no vomiting, was very excitable. Pulse, 64 ; temp., 98.4°. Mastoid process normal.

We diagnosticated an abscess in the temporal lobe, and advised an operation to be done the next day, which was conceded ; but in the night the patient had high fever (pulse, 136 ; temp., 105.3°), and died the next morning at seven o'clock, comatose.

The autopsy, made eight hours after death, discovered an enormous abscess occupying almost the whole temporo-sphenoidal lobe.

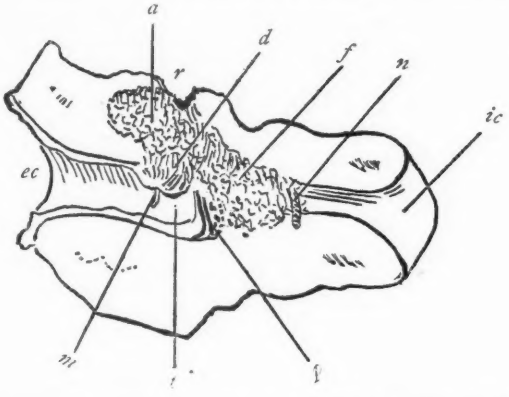
The dura mater was not essentially abnormal, excepting the parts covering the petrous bone. When the dura was incised and drawn off, the superficial layer of the brain was found discolored, gray, slightly depressed, and so thinned and disintegrated that it crumbled on a slight touch, whereupon a large quantity of very offensive, creamy, greenish pus burst forth. The perforation was situated 5 *cm* above and $2\frac{1}{2}$ *cm* behind the auditory canal. The abscess cavity was 8 *cm* long and 6.5 *cm* high (see plate A). It was lined with a thin, dark gray, loose layer of inspissated pus. This layer was surrounded by softened brain substance on all sides except directly inward, where the cerebral substance was normally consistent, but very vascular (see drawing in plate A).

When the brain was taken out, the dura on the anterior surface of the petrous bone was black, united to the bone, and perforated

at a very small place directly in front of the eminentia arcuata. After the removal of the dura, the bone corresponding to this perforation showed a defect of 4 *mm* in diameter, occupied with granulation tissue. A probe penetrated through the defect into the tympanic cavity.

It was very remarkable that the abscess had not changed the remaining parts of the brain more perceptibly ; there were no epidural suppuration, no alteration in the soft meninges, none in the cerebral substance and the ventricles. The liquid of the latter was neither increased nor discolored. No passageway was seen from the perforation of the dura into the abscess cavity. The temporal lobe was removed, preserved on ice, opened and sketched the next day, then hardened in formol (first in 5 %, then in 10 %), and preserved. In a few days it was just as white as if it had lain in strong alcohol.

The whole petrous bone, including the mastoid process and the bones surrounding the external ear canal and the glenoidal fossa had been removed at the autopsy. The next day the petrous bone was divided with a fine saw in a vertical section which passed through the midst of the external and internal meatuses (see accompanying figure, *ec* and *ic*). The membrana tympani was absent. The manubrium mallei (*m*) projected free into the ear canal. A polypus (*d*) sprang from the bony, rough,



lateral wall of the attic, occupied a part of the attic and tympanum (*t*), and was covered with thickened mucous membrane. The lower part of the tympanic cavity was empty, the medial wall (*p*) rough, on section compact and shining, perforated in the upper part. The attic (*a*) was filled with granulations and greenish masses, which extended through the perforation (*r*) in the

upper wall of the petrous bone to the floor of the middle cranial fossa, and through the perforation in the medial wall of the tympanum into the labyrinth (*f*), which they completely filled. They entered the internal auditory canal, but did not reach its orifice. The facial nerve (*n*) was well preserved. The dura mater and the bone at the posterior wall of the petrous bone were normal, as were the cerebellum and the venous sinuses.

Remarks.

It will scarcely be possible to find a more typical case of otitic abscess in the temporo-sphenoidal lobe than the one just described. Its pathogenesis is clear and has frequently been explained. What can we learn from it? I believe that a favorable result of an operation might still have been obtained when the patient was already drowsy, for examples are on record[1] of patients having been operated on in this condition that got out of the coma immediately after the operation and recovered permanently. This would have been possible in our case, for besides the abscess and the softened area around it, no essential changes were found in the brain. The operation would, as was projected, have consisted in the thorough cleansing of the tympanic, attical, and labyrinthine cavities through the mastoid antrum, further in trephining the skull at the usual place, *i.e.*, 4 *cm* above and 3 *cm* behind the external ear canal, with a broad trephine, in the same manner as I described it last year in volume xxiii. of these Archives, p. 157, in a case successfully operated on.[2]

It is evident that such cases demonstrate with convincing force the importance of a careful treatment of all chronic otorrhœas, especially when offensive secretion, caries, and polypi are present. Here the indications are met only by a radical operation, namely, the thorough evacuation of the tympanum and its accessory cavities, including the labyrinth.

[1] Among others I may mention the important case so well described by H. Schwartze in the last number of the *Arch. f. Ohr.*, vol. xxxiii., p. 283, 1895.

[2] The little patient whom I operated on, now fifteen months ago, presented herself lately. She was perfectly well. There was no discharge from her ear, and the walls of the tympanic cavity were lined with a delicate fibrous coat.

II.

The second case in its entire course was anything but typical.

Max Greenberg, aged twenty-four, of 97 Orchard Street, New York, came to the clinic Nov. 29, 1894. The diagnosis was acute purulent otitis media of the left ear. Headache and swelling of the skin over the mastoid process, but not in the canal. A weak alcoholic solution of boric acid prescribed. Advised to go to the hospital, which he did, Dec. 7th. His trouble began two weeks previously with severe headache, followed by an offensive discharge from the ear, and by the development of granulation tissue. The present condition was therefore probably a relapse of a previous purulent otitis. The patient complained of pain in the ear, but more particularly of pain in the entire side of the head, affecting at times the temple, at others the forehead, and again the occipital region; and this pain in different parts of the head persisted throughout the entire course of the disease. Percussion above the ear sometimes caused pain.

Dec. 8th.—The patient complained of pain behind the ear; the mastoid process was somewhat red and swollen, and the Leiter coil was used.

Dec. 10th.—Constant pain in and behind the ear, mastoid region doughy, the posterior segment of the drum membrane bulging. Paracentesis; escape of blood but no pus.

Dec. 12th.—Ice no longer of benefit. Deep pain produced by pressure on the mastoid. A regular *mastoid operation* was done in the usual way. A small amount of pus was found; a good deal of granulation tissue was removed with the curette. A probe penetrated readily into the attic. The pain in the head continued as before. Fundi oculorum, acuteness of vision, and visual field, normal; hearing in diseased ear = 0. As no improvement had resulted from the operation, a radical one was attempted.

Dec. 21st.—The former wound was dilated and a good deal of granulation tissue scraped out. At the beginning of the chiselling from a place quite near the posterior wall of the meatus a copious escape of dark blood occurred (injury of the lateral sinus). The wound was tamponed and the operation discontinued.

Dec. 24th.—Dressing and wound clean, pain greater than ever before, particularly in the ear. Paraentesis of the bulging posterior upper quadrant of the tympanic membrane. No pus.

Warm ear-douche gives no relief. The regular measurements mornings and evenings showed a variation of the pulse between 76 and 88 and of the temperature between 97.8° and 100.3°; once only, Dec. 14th, the temperature rose to 101.3°.

Dec. 25th.—Unquestionable sensitiveness on percussion 3.5 *cm* above the external ear canal. The patient *spits constantly, and complains of pain and a swelling in his throat which render swallowing difficult. The pharnygeal wall red and swollen, but no more than in a mild catarrhal pharyngitis.* No appetite.

Dec. 26th.—No improvement; therefore craniotomy. As the patient located the greatest pain directly above the ear, where he also felt percussion most painfully, further, as an extradural accumulation of pus in the middle cranial fossa appeared not improbable, I decided to make a trephine opening vertically above the ear. First I detached the auricle from the posterior wall of the ear canal and penetrated through the mastoid antrum into the tympanic cavity, cleansed the latter, particularly the attic, which contained a good deal of pus. The attic was dilated, especially forward and inward. On scraping the walls of this cavity with a sharp spoon, a small, cylindrical piece of muscle, evidently from the tensor tympani, was removed. Having in this way made room, I trephined the squama of the temporal with a trephine 2 *cm* in diameter. The dura was normal, pulsating at the beginning, but not later. I thrust a broad aspirator needle through the dura in different directions into the brain without obtaining a trace of pus. Then I detached with a probe the dura from the bone down to the bottom of the middle cranial fossa. No abnormality was found. On detaching the dura from the bone, suddenly a brisk hemorrhage ensued, which, however, was readily stopped by tamponing with corrosive sublimate gauze. The upper part of the skin wound was united, a perforated silver drainage tube inserted, and the wound dressed.

The reaction was considerable; the temperature, which on the day of the operation was 98.4°, rose on the morning of the next day, Dec. 27th, to 99.5°, in the evening to 101.1°; Dec. 28th, in the morning to 102°, and sunk on Dec. 29th to 100.4°.

Dec. 27th.—He complained of a foreign body sticking in his throat, spit constantly, could not swallow, and vomited repeatedly. Malt extract was the only food that agreed with him.

Dec. 28th.—Constant greenish vomiting; stupor; when asked he answers only yes or no, but seems to understand everything. Pupils and fundi normal.

The symptoms being aggravated in the afternoon, and the patient without further help seeming doomed, I made another operation at 4 P.M. I reopened the wound, laid a normal-looking, not pulsating, dura mater bare, incised it, and probed with a broad inspirator needle once more the temporo-sphenoidal lobe, and, finding pus nowhere, I thrust, to leave no stone unturned, a scalpel 3 *cm* directly inward and turned it at right angles in withdrawing, without any result. Then I dilated the wound in the upper part of the mastoid process and established a free communication between it and the upper part of the tympanum. Finally, to do my utmost in the desperate condition of the patient, I penetrated deeper into the bone at the lower part of the mastoid wound with the intention to penetrate into the posterior cranial fossa. The bone was healthy, containing small pneumatic cavities. In spite of the greatest care in chiselling, a sudden profuse venous hemorrhage occurred again, which was readily controlled by tampon

Drainage Tube. Dressing.

Dec. 29th.—Night quiet, sleeps the whole day, takes malt extract, vomiting and spitting ceased ; temp. 101.8 ° in the morning, 101 ° in the evening ; no discharge from the ear or the mastoid ; no pus on syringing.

Dec. 30th.—Temp. 103.6 °, pulse 84. Patient sleeps most of the time ; has incontinence of urine and spasms in his limbs.

Dec. 31st.—The same condition.

Jan. 1, 1895. Comatose ; temp., 104.1 °.

Jan. 2d.—In the morning, temp., 101.6 ° ; in the evening, 103.6 °. Respiration, 42 ; pulse, 124.

Jan. 3d, 11 A.M.—Death in coma.

Autopsy, 4 P.M. the same day (see plate B). The skull was opened in the ordinary way, dura little changed, no extradural suppuration. On detaching the dura a collection of whitish-yellow pus was found in the convex and median surfaces of both anterior lobes extending in serpentine lines along the sulci. Small subarachnoidal purulent foci were scattered over the anterior part of the parietal lobes (see plate B). The veins were very dark and dilated over the whole surface of the brain, more on the convexity than on the base. The posterior half of the convexity, the whole base, and the posterior two-thirds of both median surfaces were normal, apart from the meningeal congestion. The brain was removed as a whole, put on ice, drawn the next day, and then

dissected. Both hemispheres were divided by a median section; nothing abnormal was found on the cut surface. The left hemisphere from the vertex to the base was divided into parallel, sagittal slices about 1 *cm* in thickness; an abscess was found nowhere. In the posterior part there was a clot surrounded by a thin zone of softened brain tissue. This clot and a very superficial extravasation on the otherwise unchanged basis of the middle cranial fossa were the only alterations referable to the operation. The brain substance protruded slightly through the perforation of the dura mater at the place of the trephining, but showed no notable changes.

It was noticed on the anterior lobes, both on their convex and median surfaces, that the suppuration was limited to the subarachnoidal space, in no place entering into the brain itself. The cerebral substance, the ventricles and their liquid, the cerebellum, and all the venous sinuses were not noticeably changed, excepting the vessels in the left Sylvian fissure which passed through a thin layer of semi-transparent exudation. The brain was put in a 10 per cent. solution of formol, then in a 5 per cent. solution. The right hemisphere was preserved as a whole.

After taking out the brain I removed the temporal bone, on which a very remarkable condition presented itself: *the upper part of the tympanic cavity was full of pus, which collected along the dilated semicanalis pro tensore tympani, in the tissues surrounding the tube, and formed a prominence in the upper pharyngeal cavity.* A probe passed from the attic through the collection of pus, pushed forward the left half of the soft palate, and could there be felt with the index finger introduced through the mouth. I cut through the soft palate to the adjacent superior wall of the pharynx, evacuating the collection of pus—an **otitic retropharyngeal abscess** connecting with the middle ear. Then I removed the tube and its surroundings, and could ascertain that the pus had not passed through the tube itself, but through the tissues surrounding it, chiefly the tensor canal. In this way the piece of muscle removed with the sharp spoon in the last operation explains itself.

REMARKS.

This kind of abscess was new to me. With more special knowledge I would not have thought the patient's constant complaints of an impediment of deglutition sufficiently ex-

plained by the visible redness of his palate, which I mistook for a simple catarrhal pharyngitis. I would have examined the upper pharyngeal cavity with mirror and finger, and by evacuation of the retro-pharyngeal abscess would have possibly saved my patient's life. I consider it probable that the pyogenic germs travelled from the abscess in some way or other, most probably along the hypophysis cerebri, which, as we know, belongs embryologically to the palate, into the cranial cavity and thence along the median surface up to the convexity of the anterior lobes. The chiasm of the optic nerves, which for the purpose of histological examination had been removed from the skull and immediately placed in a solution of formol, showed at one optic tract a fleshy intumescence, which shall be carefully examined later on.

This remarkable condition would, if correctly interpreted, present a new, and to me at least unknown, propagation passage of purulent processes from the middle ear into the cranial cavity. It is not difficult to understand that pus escapes through the natural outlets of the tympanic cavity, the Eustachian tube and the canal of the tensor tympani muscle. It is well known that through the tube it may pass into the naso-pharyngeal space, whereas it could not find an outlet through the muscular canal, but collecting would form an abscess, which might just as readily penetrate into the cranium through numerous bone defects in this locality, as pus passes through the roof of the tympanic and mastoid cavities. In this manner we might perhaps be able to account for the fatal meningitis originating in acute purulent inflammation of the middle ear, particularly its occurrence in children in whom the cranial fissures are not yet so firmly closed as in adults. When it is not possible to ascertain a channel of propagation of purulent processes through the roof of the tympanum and the mastoid process, we should in future autopsies not omit to examine the anterior outlet of the tympanic cavity.

Literary records, which I have only incompletely searched for, are very meagre. Most text-books on aural surgery do not even mention the retro-pharyngeal abscess resulting from ear disease. Those authors who refer to it state briefly

that gravitation abscesses originating in the ear occur occasionally outside on the neck, rarely in the pharyngeal cavity (Urbantschitsch, Schwartze, Bosworth). Macewen, *Infective Diseases of the Brain*, etc., says: "Purulent inflammation in the tympanic cavity may extend into the Eustachian tube, in the walls of which an abscess may form and ultimately cause gravitation abscess in the naso-pharynx. These retro-pharyngeal abscesses are apt to occasion respiratory difficulties and impede deglutition." I have nowhere found a statement as to the development of lepto-meningitis from a retro-pharyngeal abscess. In the above described case I cannot demonstrate this connection either, but must content myself with the declaration that it was possible, nay, even most likely. O. Kœner (*Otitische Erkrankungen des Gehirns*, etc.), in the discussion of some cases (Ray, Panse), in which the suppuration had principally affected the convexity, makes the remark that such abscesses should perhaps be considered not as directly propagated, but as metastatic.

EXPLANATION OF THE PLATES.

Tab. A.

Abscess in the left temporo-sphenoidal lobe.

John A. N., twenty-eight years old, seen in consultation with Dr. J. B. MacMahon, Nov. 16, 1894. Chronic otorrhœa. The abscess was diagnosticated, the operation determined on for the following day. The comatose patient died the next morning. Post mortem in the afternoon.

Tab. B.

Max Greenberg, twenty-five years old, entered clinic Nov. 29, 1894, died January 4, 1895.

Acute purulent otitis and mastoiditis. Retro-pharyngeal abscess in consequence of suppuration in the tympanic cavity. Four operations for mastoiditis, otitis, and supposed cerebral abscess. No abscess found. Death from purulent lepto-meningitis of the convexity of the anterior lobes.

THREE CASES OF INFLUENZA OTITIS WITH EPIDURAL ABSCESSES.[1]

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THE clinical histories of these three patients belong to the large class of sequelæ of influenza. Although it has been claimed, from a pathological, anatomical, and bacteriological standpoint, that the complications of grippe do not show any special features in comparison with the corresponding primary affections, the clinical experience gathered during the large epidemics of influenza in the last six years has proven their malignancy and gravity. The prognosis must be guarded and the treatment more careful. Thus I have made it a rule, in acute otitis media immediately following influenza, not to waste any time with palliatives, but to counteract, by an early and large (*i. e.*, galvanocaustic) paracentesis the tendency of influenza to spread to the remoter portions of the middle ear. The histories of our cases, which unfortunately came too late under treatment for carrying out this principle, will protect me from the reproach of rashness. In all three, during or after an attack of influenza, a purulent otitis media with violent symptoms developed, assuming a more subacute character in the course of a few weeks. The drainage of the tympanic cavity not being sufficient, the inflammation and suppuration invaded the mastoid cells and the posterior cranial fossa, in two cases also the middle cranial fossa. The patients came under my care while suffering from otitis

[1] Presented before the German Medical Society of New York.

media purulenta. But in one only the symptoms of purulent mastoiditis were so marked that I advised an early operation. In the remaining two an energetic galvanocaustic paracentesis of the thickened *Mt* diminished the subjective and objective symptoms to such an extent that weeks passed before I found the opening of the mastoid process indicated (on account of the peculiar character and the incurability of the abundant suppuration).

CASE 1.—History of no importance. Attack of influenza Jan. 17, 1893. After a few days severe otalgia treated with applications of chamomile tea and irrigations with sol. acid. bor. A moderate suppuration set in without abatement of pain. For a while the patient felt better under the treatment of a specialist.

March 15, 1894, he came to me with intense œdema behind and above left ear, extending over the temporal region to the left eye. The ear canal completely closed by swelling, especially of the upper wall, discharging thin pus. The fever (39.2° C.) and the tenderness of the mastoid process to pressure, with apparent fluctuation, induced me to operate the next day. The intense and rigid œdematous infiltration required an unusually large incision. No pus and no discoloration of the bone. The chisel applied at the typical point opened a mastoid cell containing pus. The probe led into a narrow fistula backwards, which I chiselled open. Thus an abscess of the sulcus sinus transversi was reached, in which the pulsating elastic sinus was felt surrounded by pus. Some other cells of the mastoid and above the upper wall of the meatus were filled with pus, and another fistula ran to an abscess the size of a bean above the tegmen antri. I opened it wide and carefully scraped the granulations of the dura mater. A suture was put in the lower end of the incision and the whole wound was tightly packed and kept open for several weeks. The dura developed at first exuberant and unhealthy granulations, which by repeated scraping and cauterization were brought to a healthy condition. Healing not disturbed save by a furuncle in the external auditory canal. The secretion of the tympanic cavity soon subsided, and after three and one half weeks the perforation was closed and the tympanic cavity free. The external wound closed after six weeks and has remained so. The hearing power of this ear is good.

CASE 2.—An otherwise healthy woman, aged twenty-four, was

referred to me on April 1, 1894, by a physician who had unsuccessfully treated her for several weeks for otitis media purulenta of the left ear, after influenza. Pain in left ear and parietal region, and redness and moderate œdema of mastoid, which was painful on pressure. External meatus somewhat swollen, *Mt* bulging forward and rigid. Shrapnell's membrane, projecting in form of a sac, discharged thick pus through a small perforation. At once paracentesis (galvano-caustic) of Shrapnell's membrane and of the posterior inferior quadrant was performed ; ice applications over mastoid process. Copious and free discharge set in, relieving the pain and entirely removing the inflammatory swelling and tenderness of the mastoid within a few days. After three weeks relapse, which was relieved by enlarging the perforation. But when the pain and inflammatory swelling recurred for the third time, the suppuration not being diminished, I opened the mastoid process May 24, 1894. Corticalis healthy. A little below the surface a gray yellowish membrane presented itself, which was easily pierced by the probe ; a stream of thick, not offensive pus oozed. The whole cupola of the mastoid process formed a large abscess, from which, besides pus, a considerable quantity of spongy granulations was removed with the sharp spoon. Careful probing, however, revealed an abscess, of the size of a bean, at the floor of the middle, and a larger one at the lateral wall of the posterior cranial fossa. To gain access to the latter required the removal of the entire medial wall of the mastoid process, so that a portion of the granulating dura mater as large as half a dollar was laid bare. Healing without disturbance in five weeks. *Mt* and tympanic cavity returned to their former condition ; the previous hardness of hearing, due to sclerosis, was not diminished.

Case 3.—A physician, who had had transient glycosuria, was seized with influenza, Jan. 14, 1894. From Jan. 21st, after slight suppuration, severe otalgia had set in, especially at night, which was relieved only for short intervals, and became more severe during the night. Tenderness of the mastoid and vertigo followed. He made warm and cold applications, syringed his ear with solutions of boric acid, and instilled alcohol. March 21st he consulted a surgeon, who referred him to me. Inflammatory swelling of mastoid and meatus. The lumen of the latter was dilated by tampons, so that a portion of the *Mt* became visible. It bulged forward and showed a very small perforation ;

galvano-caustic paracentesis was followed by subsidence of irritation. The patient felt pretty well under daily irrigations of the tympanic cavity per tubam with sterilized salt water 0.6 %, although not quite free from vertigo. He had a feeling of fulness, especially in the morning before the irrigation. *Mt* became thinner and paler, as did the mucous membrane of the tympanic cavity, as seen through the round sharp-edged perforation 1.5 *mm* wide. At this stage I observed a symptom, which in another case had helped me to form a quick and safe plan of treatment, and perhaps may be of more general value, viz.: If after thorough cleansing of the tympanic cavity by irrigation, inflation, and wiping, no pulsating drop appears in the perforation for about ten minutes nor can be produced by Valsalva's experiment, nor any other inflation of air, some pus at once bursts forth, as soon as the patient coughs. This observation I have frequently repeated, always with the same result. It indicates that somewhere pus is penned up, which is not reached by the current of air or water passing through the tympanic cavity, but has sufficient communication with the latter to be forced into it by coughing. Despite repeated enlargements of the perforation after one month and the use of astringent drops, the suppuration was not diminished. Occasionally a just noticeable œdema with very slight sensitiveness of the mastoid to pressure was observed. For about 1½ weeks the ice-bag gave quite a relief, but as the temperature became slightly raised, I urged an operation, which was performed May 29th. Cortex of mastoid healthy. An abscess-membrane was pierced, and a stream of pus emptied. Numerous granulations scraped with sharp spoon. Removal of the whole medial wall of the mastoid on account of the presence of abundant pus on the cerebellar dura mater. The latter showed a black necrotic spot in the posterior inferior angle, which after three weeks sloughed with the formation of healthy granulations. In all probability here the abscess would have broken towards the meninges. The wound, almost as large as a hen's egg, gradually filled up with granulations and was completely closed by the middle of July, 1894. The suppuration of the middle ear stopped during that time, a perforation around the umbo persisting. In the beginning of October a small point of the retro-auricular scar reopened almost without any reaction and became definitely closed within two weeks after discharging two small necrotic chips of bone. Hearing not quite restored, the perforation not being closed. Some dis-

agreeable sensations behind ear are to be attributed to the dura mater being drawn into the scar.

In these three cases the infection of the mastoid apparently was not simultaneous with that of the tympanic cavity. In two the unyielding rigidity of the *Mt*, and the consequent impeded drainage, was the most probable cause of the propagation of the suppuration. The immediate relief obtained by a thorough drainage through galvano-caustic paracentesis was so promising that a confinement of the inflammation to the tympanic cavity and prevention of further spreading by the operation could be hoped for. At this time it was not apparent, but it became clear later, that a bone-operation was necessary. In none of the three cases the symptoms indicated more than empyema of the mastoid cells, the epidural and paraphlebitic abscesses being found during the operation. Many of these and even more serious complications may be prevented by establishing an early and sufficient drainage of the tympanic cavity, when in a state of acute purulent inflammation, and when the *Mt* is unyielding either from an individual disposition or from a special form of infiltration. Thus quite a number of operations on the mastoid process after acute purulent otitis media may be made superfluous.

RIGHT SUPPURATIVE OTITIS MEDIA; EXTENSIVE THROMBOSIS BEGINNING IN RIGHT PETRO-SQUAMOUS SINUS; LEFT CEREBELLAR ABSCESS.

By A. H. CLEVELAND, of Philadelphia.

(*With one figure in the text.*)

THE following case will be of interest in showing a remarkable and, I believe, unique form of sinus thrombosis with unusual sequelæ. It is briefly as follows:

Nicholas Van D., aged six, American, white, presented himself at the dispensary of the Presbyterian Hospital on July 18, 1894, complaining of an escape of blood and pus from right ear. A history was given of earache during the previous winter, which was variously treated with drops, roast onion, etc. These pains continued intermittently until four weeks previous to his coming to the dispensary, when they were relieved by the discharge. This soon became irregular, ceasing once or twice altogether, during these four weeks. There was no history of injury nor was the hearing apparently affected. The family history was negative. An attack of measles three years ago had had no aural complications.

When first seen there was a copious purulent discharge. After cleansing, the membrana tympani was seen to have two perforations, one a very small one in the posterior lower segment, and one much larger in Shrapnell's membrane. There was at this time some pain in the ear, but the child was bright and seemed otherwise well.

A one-quarter strength peroxide of hydrogen solution was ordered, to be used with a soft rubber syringe.

On Aug. 1, 1894, he again came to the hospital. The syringing had always relieved the pain and given much comfort. That morning, however, he had seemed drowsy and had vomited once. Finding some pain with considerable discharge and a temperature of 101.4°, he was at once admitted to the ward.

The hospital notes on admission are as follows:

Medium-sized white boy of six years. Skin and mucous membranes somewhat anæmic. Pupils normal; react to light and distance. Tongue clean, red, and moist. Pulse about normal in frequency, of good strength and volume. Examination of lungs negative. Heart sounds clear at base and apex. Abdominal viscera of normal size and position.

The temperature on admission was 102°. This sank during the two succeeding days to normal, and continued so until the evening of the 6th, when it shot up to 104°. In the course of the next day it sank to about normal, staying there for two entire days. There was then a gradual and continual increase to between 102° and 104°, at which height it remained. At no time was there a chill.

The bowels were constipated, several times requiring castor oil or an enema. The urine was clear, acid, sp. gr. 1020, showed no traces of sugar or albumen. I regret that no examination of the eye-grounds was made.

On Aug. 11, 1894, the discharge seemed to have ceased and investigation showed the membrana tympani bulging. Free incision was made in posterior segment, but no discharge followed. During the entire time he was in the hospital the patient complained of more or less pain in the right ear and in the digastric fossa. In the intervals when the temperature fell the pain was markedly less.

At no time was there the slightest tenderness or swelling over the mastoid process. There were also absolutely no symptoms pointing to involvement of the left ear.

On the 13th the pain became more intense, the respiration hurried, and there was some swelling on the right side of the face.

Owing to inability to reach Dr. Charles H. Burnett, the aurist to the hospital, Dr. O. H. Allis, of the surgical staff, saw the case in consultation.

In spite of the fact that no symptoms pointed definitely to mastoid involvement, it was thought best to make an exploratory opening. This was done with an entirely negative result. At my suggestion Dr. Allis then made a dissection for a considerable distance into the digastric fossa, hoping to find a burrowing abscess. As before no pus was found. The wounds were closed, the boy recovered from the ether, but died at 7.30 o'clock the following morning.

The autopsy was held the next afternoon and yielded the following notes:

A fairly well-developed and well-nourished boy of six years. Circumcised. Rigor mortis and post-mortem lividity well marked. Back of right ear is a recent incision, evidence of operation of yesterday. On right side extending from mastoid to clavicle is a patch of green discoloration about the thickness of a man's finger at its widest part; bordering this is a yellow discoloration.

On dissecting back the scalp an extravasation of blood is found behind and above right ear. The sutures show prominently as white lines.

The longitudinal sinus contains a few small blood clots, but is almost empty. On the *right* side the petro-squamous sinus is abnormally large and deep, being at one or two points almost entirely bridged over by bony processes. At its anterior extremity necrosis has taken place and pus has entered the sinus, causing a thrombus. This extends backward into the lateral sinus.

The *right* lateral sinus contains a bluish-yellow purulent-looking thrombus, which extends down into the jugular vein and around posteriorly into the *left* lateral.

Posteriorly in the *left* cerebellar fossa is a considerable amount of grayish-yellow lymph, adherent to the dura.

Both occipital lobes present at their extremities small patches of a dark greenish-red color, looking somewhat like small abscesses.

The membranes of the brain except over the sinuses and in the *left* cerebellar fossa seem normal. The brain is of good size, vessels well filled with blood—apparently abnormally full of blood about the base.

In addition to the two spots on the occipital lobes there seem to be spots, similar in color, on the posterior part of the superior

surface of the left cerebellar hemisphere. These are apparently due to subarachnoid lymph. The ventricles seem normal, the vessels well filled with blood, especially those of the left lateral ventricle.

The spots on the occipital lobes seem to be due to the exudation of lymph beneath the pia, with discoloration and apparent softening of the subjacent gray matter. There is no distinct inflammation or suppuration more than is shown by the small amount of lymph on the outside.

Examination of the cerebrum is otherwise negative.

Examination of the cerebellum, pons, and medulla shows no change, except the spot previously noted on *left* cerebellum. Here there is not only exudation of lymph, but distinct softening of the cerebellar substance, extending to the depth of half an inch. The fissures at this point are absent, and the convolutions are entirely broken down and homogeneous.

Examination of the abdomen shows slight enlargement of the liver, spleen, and pancreas. Otherwise it is negative.

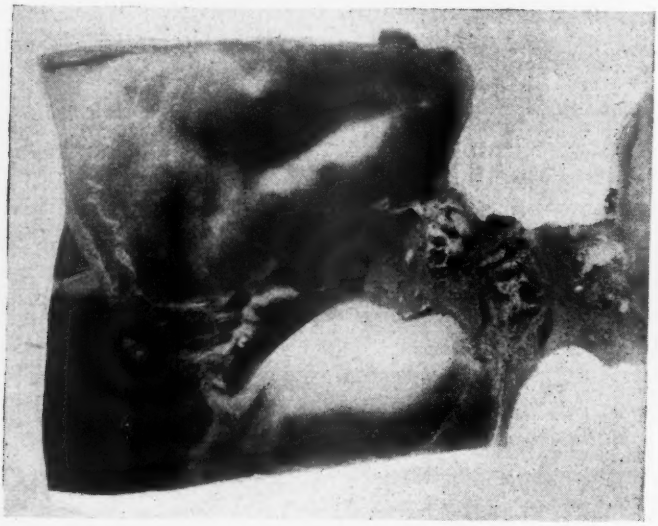
Later section showed the ossicles on the right side to be apparently entirely healthy. At a point on the petro-squamous sinus nearly half an inch posterior to the communication with the middle ear there is marked necrosis of the bony wall upon the petrous side. See accompanying drawing.

The case is of interest, not only on account of the involvement of the opposite brain, but more especially as regards the persistent and enlarged petro-squamous sinus and the fact of its being the path of infection.

I am not aware of its having ever been determined in what proportion of cases this sinus is found, or to what age it usually persists. At the same time it may, as the present instance shows, become a source of the gravest danger while entirely unsuspected. Opening the lateral sinus would probably have been of no permanent benefit in this case. Had it been possible to entirely remove the thrombus from this sinus, the source of infection would still have been present.

Abscess of the *opposite* cerebellum has been reported, to my knowledge, in but three cases. Of these the first,

reported by Wilks (*Med. Times and Gazette*, London, 1861, ii., p. 349), seems doubtful as, while the title of the report gives the abscess upon the opposite side, the autopsy notes appear to make it upon the same side.



Anatomical text-books rarely make mention of the petro-squamous sinus. The only descriptions I have been able to find are in *Morris' Anatomy* (1893 Ed. p. 647), and *Quain's Anatomy* (1892 Ed., vol ii., part 2, p. 524). The latter is as follows: "An additional petro-squamous sinus is sometimes present, lying in a small groove along the junction of the petrous and squamous portions of temporal bone, and opening behind into the lateral sinus. In rare cases the petro-squamous sinus is found passing through an aperture (foramen jugulare spurium) in the squamous part of the temporal bone, between the orifice of the external auditory meatus and the glenoid cavity, and then joining the temporal vein, thus resembling the arrangement in the dog and many other animals, in which a similar vessel forms the principal outlet for the intracranial blood. In the human subject also, at an early period of fœtal life, the lateral sinus is continued forward in this course, and opens into the primitive (afterwards the external) jugular vein, and the occurrence of a petro-squamous sinus is due to the persistence of this channel, which usually becomes obliterated after the development of the internal jugular vein."

The other cases are of later date and have been reported by Prentiss (*Am. Jour. Med. Sci.*, April, 1882, p. 453), and Knapp (ARCHIVES OF OTOLOGY, 1892, p. 239).

A STACKE MASTOID-OPERATION, FOLLOWED BY AN EPILEPTIC ATTACK.

By MAXIMILIAN HERZOG, M.D., Chicago, Ill.,

late laryngologist and otologist, German Hospital, Cincinnati, O.

IN looking over the literature I am unable to find a report of any case or cases of mastoid operations followed by an epileptic attack. To Dr. E. S. Allen, of Cincinnati, I am indebted for the verbal communication of a case of this kind which he had occasion to observe at the ear-clinic at Halle in 1892. In this case I was told an epileptic attack developed about one month after a Stacke mastoid-operation. The outcome was a fatal one, as the patient collapsed, and never rallied from the epileptic coma following the convulsive attack.

The case which I am to report, previous to the operation offered the following history:

C. P., aged nineteen, well developed, well nourished young man, had always been in good health. Neither he himself, nor his parents, nor his brothers and sisters, had ever been the subject of any nervous diseases. When first seen on September 19, 1893, he stated that ever since 3½ years ago, after a cold or an influenza, he had been suffering from a running ear on the right side; this secretion, in spite of repeated treatments, had never ceased entirely.

The examination showed that the right meatus was filled with thick, yellow-greenish, extremely fetid pus. No external changes to be noticed at the mastoid region, which is not tender on pressure. Tuning-fork tests (with a small A^{440} tuning-fork): Exp. Web. to the right side; Rinné r. + 8; l. + 9; hearing distance for whispered voice, r. 5 metres; l. more than 7 metres.

When the right meatus is syringed, masses of macerated epi-

dermis and small epidermoidal pearls are removed. The tympanic membrane appears thickened, but the manubrium of the malleus can be seen distinctly ; a perforation of the size of a pinhead, or a little larger, presents itself in the superior anterior quarter of the membrane, very near the notch of Rivini. The sound introduced through the perforation discloses the presence of uneven, eroded bone.

The diagnosis of otitis media chronica purulenta cum cholesteatomate and necrosis in the attic being made, a mastoid operation was recommended. The patient, however, not being willing to submit to an operation at once, was first subjected to a very thorough course of treatment consisting in daily syringing, followed by the instillation of sodium tetraborate, peroxide of hydrogen, and europhen and aristol insufflation. All these therapeutical agents were tried alternately in the course of three months. The europhen and aristol powders were insufflated directly into the tympanic cavity by means of a powder-blower with a Hartmann-Bezold canula as a nozzle. The success of this treatment insisted upon almost every day for nearly three months was only a partial one ; the secretion and the fœtor diminished, but did not at any time disappear completely. The patient then gave his consent to an operation. This was performed on December 6th, at the German Hospital at Cincinnati, with the assistance of Dr. E. S. Allen and several other gentlemen.

At an examination of the circulatory and respiratory organs, made before placing the patient upon the operative table, he complained of a tickling sensation in the larynx, and a constant tendency to cough, which had made itself manifest for the last twenty-four hours or so. Nothing abnormal being ascertained by the physical examination of the lungs, no weight was attached to this statement.

The operation made under chloroform-narcosis was somewhat prolonged by the fact that the mastoid process, by the long-standing inflammatory changes, had become completely eburnated, and was extremely hard, offering a good deal of resistance to the mallet and chisel. The landmarks for the operation—the linea temporalis and the spina supra meatum—were perfectly normal in position, and the construction of the cone to be chiselled out offered no special difficulty, though the antrum was only found at a depth of from 14–15 *mm*, and its cavity was very small. The operation was not absolutely eventless, as about one hour after its inception the patient suddenly stopped breathing. The pulse,

however, was good, and the respiration could be restored at once by artificial means and the stimulus of cold. The antrum, when laid open, was found to be filled with cholesteatomatous masses and soft, ill-looking granulations. So were the aditus and the attic. All the diseased bone having been removed by the chisel and the sharp spoon, the wound was washed with a carbolic-acid solution, iodoform was powdered over the open surfaces, and a tampon of iodoform gauze tightly pressed into the bony cavity made by the operation. Time of the operation, 1½ hours. Chloroform used, 50.0–60.0 grammes.

The first change of dressing occurred on Dec. 11th, the second on Dec. 13th, the third on Dec. 18th. It may be at once stated that the healing of the wound under the use of carbolic-acid solution, iodoform, and later aristol, was perfect in every respect, so that in March, 1894, the patient could be dismissed perfectly cured of his ear trouble. There was then a small diminution of the hearing distance for whispering voice for the right ear. This diminution was probably due to cicatricial contractions in the region of the annular ligament of the foot-plate of the stapes. Five days after the operation, when the dressing was changed for the first time, and the hearing power of the ear operated upon was tested there was certainly no loss, but gradually a small loss became manifest.

The temperature after the operation, which had been made under the strictest aseptic precautions, never rose above 99.40°, but the symptoms of a slight bronchitis with a yellowish viscid sputum appeared. Influenza being prevalent at the time, the sputum was examined for Pfeiffer's bacillus, and as this micro-organism was found, pure cultures were made from the sputum. They showed all the characteristics as described by Pfeiffer for his bacillus, and it was therefore evident that the patient was suffering from a mild attack of influenza, and most probably had been in the incubation stage of this disease at the time when he was subjected to the mastoid operation. The influenza took a mild course, the temperature never ran up, the wound behaved excellently and everything seemed to be all right, when on the morning of Dec. 22d I received a report concerning the patient which did disagreeably surprise me in a high degree.

The sisters at the hospital made the following statement :

The patient, the previous evening, had been up till 11 o'clock, then he retired ; nothing unusual was noticed about him. Between 11½ and 12 o'clock a loud noise was suddenly heard in the private

room of the patient, and when it was entered he was found on the floor near his bed, undressed, unconscious, in convulsions, biting his tongue, with foam before his mouth. He was put to bed, and after a little while, without rallying from the coma to a perfectly wide-awake state, fell asleep, and slept till late the next morning.

The patient himself made the following statement: He said that he did not feel very well the previous evening; he felt excited and restless. After he went to bed, it appeared to him suddenly that he was not in the hospital any more, but in a zoölogical garden; he saw himself surrounded by yellow lions from everywhere; he wanted to call for help, but he could not. This was all he remembered. When he woke up the next morning he felt tired and languid and weak, and he noticed with astonishment from certain observations that somebody must have been in his room during the night, but he could not remember anything at all about it.

There could not be the least doubt that here was an epileptic attack with all its details; aura, convulsive stage, post-epileptic coma, and even the distinct after-effects (languor, etc.) of the attack. The dressings were at once removed, and the wound examined; nothing giving rise to the least dissatisfaction or suspicion could be found; the iodoform-gauze tampon was lying tightly in the bony cavity, but it had never given rise to any sensation of pressure, discomfort, or pain. The wound was therefore dressed again, and the three bromides were ordered to be given three times a day (one gramme of each of them thrice daily). This medication was kept up for over two weeks. There was no recurrence of the epileptic attack; the patient made an uninterrupted recovery in every respect, and during the next few months gained rapidly in weight.

I am unable to give any opinion as to what cause or causes the epileptic attack was due. It is said that foreign bodies in the meatus or in the tympanic cavity may in children cause epileptic attacks; cases of epileptic attacks have also been reported after an influenza infection. But whether the epileptic attack reported in the above case was due to a tampon which did not give rise to any irritation, but which may have been placed too tightly into the cavity of the middle ear, or to the influenza, or to neither, I am not able even to guess at.

CASES OF EMPYEMA OF THE FRONTAL AND ETHMOIDAL SINUSES CAUSING ORBITAL TUMORS.

By DAVID N. DENNIS, M.D., Erie, Pa.

THE following cases are instructive as clinical studies, and interesting because of the comparative rarity of like recorded cases in medical literature.

Case I.—Empyema of Frontal Sinus—Operation—Recovery.

Mrs. Mary B., aged sixty-four, first consulted me on Jan. 19, 1891, complaining of constant pain in the head and around the left eye with loss of vision in this eye. General health good: family history good. For a year or more had noticed a swelling in inner and upper corner of left orbit. This had steadily increased in size; pain in head increased by stooping. Inspection showed pronounced exophthalmus of left eye; eyeball displaced outward and downward; eyelids barely covering eyeball. Vision R E $\frac{6}{ix}$, L E sees objects and counts fingers; diplopia. Ophthalmoscopic examination showed clear media; retinal veins rather larger than normal; optic nerve normal in appearance. In the left nostril were found two or three small polypi. Patient was sent to hospital for operation. Under ether, and with strict antiseptic precaution, an incision was made along upper margin of orbit, extending from inner angle to about its middle. The finger passed into cut, revealed sharp bony edges of opening into frontal sinus. The incision was carried down and a free opening made into sinus. There was a free discharge of muco-purulent matter; the cavity was very thoroughly washed out with bichloride solution 1 to 1000, and then explored with little finger for a possible growth. There was nothing found. A drainage tube was passed into the

cavity, and a dressing applied. The cavity was washed thoroughly twice a day. No communication being established between sinus and nostril at the end of second week, an effort was made, by removal of polypi from nose, to establish it. On the second day after their removal a severe attack of erysipelas set in ; fortunately the orbital cellular tissue was not invaded, the patient making a good recovery. It was found that good drainage had been established from sinus through nostril. The irrigation was continued for a period of four months ; at that time there was very little, if any, discharge. The exophthalmus had entirely disappeared. No diplopia. Vision both eyes $\frac{6}{ix}$. Eye-ground normal. The patient was seen again in May, 1894. There had been no recurrence of the trouble ; headache relieved. Vision, both eyes, $\frac{6}{ix}$.

Case II.—Empyema of Frontal Sinus—Operation—Recovery.

Mr. J. B. S., aged seventy-two, first consulted me on September 11, 1893. General health good ; family history good. History of exophthalmus and swelling near inner and upper margin of left orbit. This had been operated on by a surgeon some two years prior to consulting me. The result had been satisfactory. A few weeks before his visit, the eyeball had become prominent ; considerable headache ; pain aggravated in stooping ; ophthalmoscope showed clear media, normal optic nerve and vessels. The wound made at first operation was opened up and free drainage established between frontal sinus and nostril. The mucus was very tenacious and difficult of removal. Dobell's solution was used for cleansing the cavity. This treatment was kept up for three months ; the washing was then discontinued. Patient seen again on October 28, 1894. There had been no headache ; the wound had closed entirely ; no exophthalmus noticeable. Vision, $\frac{6}{6}$ in each eye.

Case III.—Empyema of Ethmoid Cells—Operation—Death from Meningitis.

Mrs. Alice G., aged thirty-two, English by birth, first consulted me on Sept. 8, 1893, giving a history of repeated crops of polypi in nostrils, that had been removed from time to time. Her physiognomy was very peculiar : eyes wide apart and very prominent ; nose very wide at bridge, increasing in width down to lower

third, and then decreasing at alæ. The skin over bridge was of a reddish color. General health poor; some cough, evidently from mouth-breathing and nasal irritation. The nostrils were found filled with polypi. These being removed, the right nostril was found very capacious, the growths having crowded nasal septum far over to left side. The turbinated bodies were almost entirely gone. Left nostril correspondingly small, from encroachment of septum. Roughened bone could be felt with probe in roof of nostril; its exact location could not be determined. The patient was very much relieved by removal of growths, it being possible for her to breathe with mouth closed. The cough very much better. She reported occasionally for removal of recurring polypi until July, 1894, when she began complaining of excessive headache and pain around left eye. The vision was R $\frac{6}{IX}$, L $\frac{6}{XXX}$. There were hyperopia in the right eye and astigmatism of 2 D in the left. With these errors corrected she had vision of $\frac{6}{6}$ in each eye. Eyelid and orbital tissue œdematous; some exophthalmus; eye crowded to left; a growth could be seen at inner portion of left orbit. This was quite tender on pressure. An effort was made to establish drainage from ethmoid cells through nostril. While a considerable quantity of muco-purulent matter could be freed, it did not relieve headache and pressure around eye. The patient began to complain of night sweats, and had some fever, and increasing pain around eye. July 16, 1894, was sent to hospital for operation. Every precaution was taken to make area as aseptic as possible. Under ether an incision was made along upper margin of orbit; a second incision made along side of nose, joining the first. The triangular flap thus formed was turned down and the inner surface of orbit exposed. A bony protuberance was found, covering an area corresponding to the ethmoid sinus. This was perforated, a quantity of purulent matter escaping. The bony cells of ethmoid were broken down with the curette and free drainage established into the nostril. The nasal bones were found necrosed. A probe could be passed along outer surface of nasal bones and lower third of frontal, which was also found roughened. A free incision was made in middle of forehead down to the bone; fluid passed in at this opening escaped through the nostrils. Gauze drainage used. The gauze removed, and sinus and necrosed area of bone thoroughly irrigated every day; free drainage kept up. No fever or night sweats after free drainage was established; headache relieved. This improvement continued for about two

weeks, when, in spite of the greatest care in matter of cleanliness, septic meningitis developed, patient dying on Aug. 2d. No post-mortem.

The case is a peculiar one in regard to the extensive destruction produced by long-continued pressure, the almost complete absence of turbinated bodies, the carious nasal bones, and the evident extension from the nasal to the frontal bone. It would be hard to say whether the perforation in the nasal bone took place from within outward, or necrosis was produced by periostitis, and then perforation from without in. No doubt the other accessory sinuses were involved.

In cases I. and II. the mucus was so very tenacious that it was almost impossible to thoroughly empty the sinus. This was accomplished by the free use of Dobell's solution, the soda contained in the solution liquefying the mucus. After using this a 3 grain solution of silver nitrate was thrown into the cavity. This modified the secretion most decidedly, not only in quantity, but also in character. The operation usually done in cases of empyema of the frontal sinus is the one of opening the sinus from the orbit. This is the operation done in the cases given. A paper written by Dr. Guilleman, of Paris, and published in the *Arch. d'Opht.*, for Jan., Feb., March, and April, 1891, goes quite extensively into the anatomy of parts, and advocates the use of the trephine. The technique of the operation is to make an incision in the forehead a little above root of the nose; the skin and fascia, including the periosteum, are turned back. A small trephine is then used to open the frontal sinus. This is drained by passing a tube through the external opening into the sinus, and then, by means of a specially constructed probe, through the infundibulum into the nostril. It is claimed that in this way the sinus is more accessible and that drainage is more thorough. It would seem as though the disfigurement would be considerably greater than in the operation through the orbit.

A CASE OF SPONTANEOUS DEHISCENCE OF THE WALL OF THE SUPERIOR SEMICIRCULAR CANAL.

By JOHN DUNN, M.D., Richmond, Va.

HAVING occasion to remove, at autopsy, the brain of a well developed negro, aged about thirty-five, I further stripped off the dura mater from the base of the skull to examine the condition of the right lateral sinus. The appearances presented by the upper anterior and posterior surfaces of the two temporal bones have been thought worthy of being reported. It is to be stated here that no pathological conditions were present in either brain or temporal bones. The dehiscences were what have been termed spontaneous.

Right temporal bone.—Superior surface. Large, irregular dehiscence, showing several large air spaces at the petrosquamous junction; the two largest of these air cells are above and external to mastoid antrum; the innermost one opens directly into the external part of the mastoid antrum. Internal to these cells are twenty or twenty-five small dehiscences in the tegmen antri and tegmen tympani. A bristle passed into the more external of these dehiscences goes into the mastoid antrum; passed into the internal, goes into the attic and thence into the middle ear.

More internal still and slightly posterior to these last is a *transverse dehiscence, 5 mm long, of the whole of the superior bony wall of the superior semicircular canal, so that the ridge of bone usually marking the position of this canal is much reduced in size.* Thus the outer layer of the dura mater served as the superior wall for the superior canal.

More internally still is a large dehiscence over the position of the geniculate ganglion. The air space beneath this has, however, no communication with the Fallopian canal.

More internal still, the upper covering for the carotid artery shows a large gap in the bone.

The posterior surface of the petrous bone shows well marked remains of the fossa subarcuata and a very deep impression below the slit marking the entrance to the aquæductus vestibuli. The sigmoid fossa is wide and deep, but does not approach the line of operation in opening the antrum; there are no dehiscences in the outer wall of the carotid canal.

Left temporal bone.—The anterior surface here shows the same dehiscences as noticed on the right side, except that the bony covering for the superior semicircular canal is thick and the ridge well marked, and that the whole of the superior wall of the carotid canal, save just at the bend, is absent. The left sigmoid fossa is very slightly marked, so also are both the recessus and the remains of the fossa subarcuata.

On either side of the middle line the bony covering for the body of the sphenoid bone shows minute dehiscences. There is nothing noteworthy about the frontal sinuses.

The canal for the mastoid vein is very small on both sides. The canal for the occipital vein has a diameter of 1½ *mm.* The right posterior condylar foramen is wanting; the left has a diameter of 1½ *mm.* The fact that in the living subject a part of the bony wall of the superior canal is wanting for one fourth of its extent is worthy of notice, and adds one more to the already numerous avenues of escape into the cranial cavity of pus originating in middle-ear inflammations.

A NOTE ON THE TREATMENT OF OTITIS EXTERNA CIRCUMSCRIPTA, WITH SALICYLIC ACID COLLODION.

By JOHN DUNN, M.D., Richmond, Va.

THE following has proved in my hands to be the best treatment for furuncular inflammation of the external ear:

℞ Salicylic acid . . . . . ʒi
Collodion . . . . . ℥i

m

Sig: Apply once daily with camel's-hair brush or with cotton and probe.

Take the following case as an illustration of the mode of action of the above combination.

Miss S., aged twenty-three, Oct. 23d came for treatment. External auditory meatus, A. S., nearly closed; pain severe; swelling greatest at upper anterior angle; enlargement of gland at angle of the jaw. I had attended Miss S. on two previous occasions for furuncle of the external canal; both times I had been obliged to make multiple incisions through the skin of the canal; on one of these occasions the swelling over the mastoid had been so great and the pain so severe as to render the diagnosis of simple furuncular inflammation of the external canal doubtful. After cleansing and *drying* the canals, in the secretions of which were found spores of one form of aspergillus fungus and the monad forms of bacteria, an application of collodion and salicylic acid was made to the whole canal external to the drum-head. The same was done each morning for three or four days; two days were then allowed to pass before the last application was

made. At the end of this time, when the collodion film was removed (and, of course, the old film should be removed before each new application), the canal was found to be perfectly clean and the skin in its normal condition, save at one point, *i.e.* at the junction of the upper and anterior walls of the canal, where for an area the size of a pin's head the epithelium was raised in the form of a little teat, containing a drop of matter. The pain about the ear had entirely disappeared, and while the gland at the angle of the jaw was still somewhat swollen, it had much diminished in size and was no longer painful.

The canal, A. D., was found to be more or less completely occluded with a mycotic mass and dead epithelium. This canal was also carefully cleansed and the salicylic collodion applied as in the canal, A. S. A few applications resulted in restoring the skin to a healthy condition.

This salicylic collodion combination has proven to be the most efficacious of the remedies used for mycotic invasion of the external ear, where the drum-head has not been involved. It is not advisable to apply it to the drum-head, as the following case will show :

Dr. A., aged sixty-seven, complained of intense itching of the external auditory canals, together with gradual loss of hearing. Finding the skin of both canals apparently thickened and covered with dry scales, and the same condition existing, though to a less degree, for the skin covering the drum-heads, I applied salicylic collodion to canal walls and drum-heads. Dr. A. called the next day to say that in blowing his nose, he had ruptured the drum-head, A. D. Examination revealed a small hole just below and posterior to the end of the handle of the malleus. The collodion film was removed from both canals. No trouble resulted from the application to the left drum-head. The rupture in the right drum-head healed after a few days.

Now, while in this case I think that it was to the action of the salicylic collodion that the rupture must be attributed, removing as it does so much of the thickened epithelium, yet I think the rupture demonstrated the diseased condition of the drum-head. I do not think that the same thing would occur from the application of salicylic collodion to a healthy drum-membrane.

This combination is, again, an excellent one for relieving for a shorter or longer time the itching, sometimes so annoying, in dry, scaly conditions of the external canal.

In most cases the application of salicylic collodion to the external canal is quite painful for the few minutes while the film is forming. This painful sensation, however, quietly passes away. The action of the collodion in preventing the spreading of the inflammation beyond the point affected, of limiting the inflamed area by constricting the adjacent skin, is much assisted by the thinness of the skin of the external canal and its firm adhesion to the cartilage and bone.

GROWTH OF THE ASPERGILLUS GLAUCUS IN THE HUMAN NOSE.

By JOHN DUNN, M.D., Richmond, Va.

So far as the literature at my command informs me, the following is the first reported case where the Aspergillus glaucus has been seen growing in the human nose. Schubert (Nuremberg, 1889) reported three cases in which he found in the nasal secretions the Aspergillus fumigatus (?). There is, however, in the abstract of this report seen by me, nothing to show that this form of aspergillus existed in these cases in such quantities as to render them visible to the naked eye; and the question is an open one, to some degree at least, whether or not this fungus, as found by Schubert, developed in the nose, or was inhaled and deposited in the secretions in which it was afterwards found. Siebenmann, in the same year, reports a case in which, in a mass of secretions removed after death from the naso-pharynx, he found one of the varieties of aspergillus fungus. Michel suggests they developed after death. John N. Mackenzie (*N. Y. Med. Journal*, Aug. 25, 1894) reports a case of Aspergillus mycosis of the antrum of Highmore, due to the presence of an aspergillus, which Dr. Flexner is inclined to believe to be the Aspergillus fumigatus. Mycosis of the naso-pharynx, due to the presence of the leptothrix fungus, I am inclined to believe is not very rare, as I have had under my care four well marked cases of this trouble. In the case to be reported there was no inflammation of the nose due to the presence of the aspergillus, although this fungus covered two areas, each a quarter of an inch in diameter.

On Oct. 20, 1894, I applied in the case of Mr. B., aged sixty-eight, to either side of the nasal septum posteriorly, chromic

acid, for the purpose of reducing a considerable hypertrophy of the erectile tissue there situated. Two weeks later Mr. B. called at my office to have a second application of acid, all treatment having in the meanwhile been neglected by him. Posterior rhinoscopy revealed the fact that the scabs made by the application of the acid had not come away. These scabs, each about a quarter of an inch in diameter, appeared in the mirror to be covered with a brownish, yellow looking substance, resembling somewhat mould as seen on the top of jellies. On removing the scabs and looking directly at them, this mould was found to be yellowish brown in mass as seen against the dark scab. Microscopic examination of this substance revealed the fact that we had to do with one of the fungi. Repeated slides of the growth and of cultures made from it convinced me it is the same fungus as that called by Massee Aspergillus glaucus (*British Fungus-Flora*, vol. iii., p. 295, London, 1893). Massee's description is as follows :

" Hyphæ creeping, floccose, branched, indistinctly septate, uncolored ; fertile erect, simple, almost without septa, hyaline, or with a glaucous tinge, the apex inflated into a vesicle covered with minute cylindrical sterigmata or conidiophores, each having a chain of conidia ; conidia globose, slightly asperulate, hyaline, then glaucous, 8–10 u diam.

" The conidial condition of the Eurotium herbariorum."

From the growth as obtained from the nose of Mr. B. repeated cultures were made both in sterilized agar and paste. These cultures were again and again examined at different intervals. They were examined dry and in different liquids. Several staining fluids were also used, but as they added nothing to our knowledge of the minute structure of the growth no further mention will be made of them. This mould as grown in agar or flour paste in a few days developed the characteristic dirty green color.

The above case is of interest as showing that under certain conditions the spores of the aspergillus fungus may develop both mycelium and fruit-heads in the human nose. In this case its growth was attended with no inconvenience to the patient ; nor had the growth any hold on the mucous membrane, being confined to the material of the scabs, the result of the destruction of hypertrophic areas by chromic acid. It may be further said that Mr. B. has suffered many years from diabetes. There was no recurrence of the growth after removal of the scabs.

THE TREATMENT OF CHOLESTEATOMA OF THE PETROUS BONE WITH A PERMANENT RETRO-AURICULAR OPENING.[1]

By Dr. C. REINHARD,

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Translated by Dr. Max Toeplitz, New York.

CHOLESTEATOMA is one of the more frequent causes of chronic suppuration of the middle ear, occurring more frequently in otitis media suppurativa chronica than one is apt to suppose. This is proven by conditions found during autopsies and operative exposures of the cavities of the middle ear. Stacke asserts that in suppuration of the attic he has found cholesteatoma in the antrum much more frequently than he had expected. I also, in those cases in which the suppuration, as a rule, was located posteriorly above, and opening of the cavities was, after many useless therapeutic attempts, required for their cure, found the antrum to be affected by deposits of cholesteatomatous membranes which by their purulent disintegration kept up the aural suppuration, while the walls of the tympanum and attic frequently exhibited spontaneous cure by epidermization.

Among 84 openings of the antrum, which I have made during the last 5½ years, cholesteatoma was found 25 times. Of these 13 are cured, in 9 the cure has lasted for from 1 to 4 years; the duration of observation of the remaining 4 cured cases extends over a period of from 2 to 10 months.

Three have died, viz., two from cerebral abscess and one from

[1] Read before the third meeting of the German Otological Society at Bonn, June, 1894.

sinus-phlebitis and pyæmia. The operation upon them was performed too late. Suppuration has returned in four cases, which have been treated by securing cicatrization of the opening behind the ear and using irrigations through the opening according to the former method. Five cases are still under treatment, two of which can be very soon discharged as cured.

Cured	13
Died	3
Relapses	4
Still under treatment	5
Total	25

The favorite location of otitic cholesteatoma, as is well known, is the antrum and the attic, from which it spreads, now rapidly, now slowly, to the remaining cells of the mastoid process. In rapid growth, the bony septa between the isolated mastoid cells succumb to the tumor, so that a more or less large cavity is formed; in slow development, when the chronic irritation due to the middle-ear suppuration has sufficient time to act, an extensive osteo-sclerosis of the entire mastoid process is almost invariably found, so that the latter is frequently to be compared to an ivory block, at the bottom of which either the antrum, enlarged by the cholesteatoma, or the aditus ad antrum is situated as the only remaining cell.

Wegener described (*cf. Arch. f. Ohrenheilk.*, vol. xxxi., p. 256) at the Tenth International Medical Congress, at Berlin, Schwartze's method of operative treatment and after-treatment of the mastoid in cholesteatoma, which consisted in the removal of the cholesteatomatous masses through the widest possible opening from the planum mastoideum, and in the formation of a large persistent opening by transplanting cutaneous flaps from the scalp. Relapses which were frequently observed after the wound had closed were thus to be prevented. Newly formed membranes could then, without another operative procedure, be removed before putrefaction took place.

While for the removal of cholesteatoma of the petrous bone Schwartze's method of opening the mastoid, with subsequent irrigations from this opening toward the tympanum,

was almost exclusively practised until a few years ago; the forced irrigations through the partly artificial bony canal have lately been replaced by more extensive opening of the antrum and the remaining cavities of the middle ear. Acting upon purely surgical principles, we attempt at removing the disease directly, in which case, of course, the remaining function of the membrana tympani and remnants of the ossicles are completely sacrificed. The frequent relapses, which are especially apt to be observed in cholesteatoma, and the fact that in the latter there is anyhow, in most cases, a permanent and complete loss of function of the remnants of the membrana tympani and of the two outer ossicles, led to this sacrifice of the function of the ear to the dangerousness of the main disease. At the same above-mentioned congress (Berlin, 1890), Stacke described the opening of the cavities of the middle ear in chronic suppuration, which had been previously practised in a different way, and recommended by Küster, Zaufal, and Hartmann. Stacke opens the attic by removal of the pars ossea, the aditus by removal of its lateral wall, and the antrum by extensive resections of the posterior wall of the external meatus. He thus exposes all those cavities of the middle ear, which are the favorite seats of cholesteatoma, and by coating the newly formed cavity with skin he produces a direct communication between the external meatus and antrum. Since this proposal of Stacke three and a half years have elapsed, during which period the opening of the cavities of the middle ear which he recommended could be sufficiently tested, and has fully stood the test. The question now arises, whether otitic cholesteatoma, with this extensive opening of the cavities of the middle ear, still ought to be treated according to Schwartze's view with wide, permanent opening behind the ear, as formerly, or whether a permanent opening in the *posterior wall of the external meatus* suffices to prevent relapses with their untoward consequences for the life of the patient. In small, uncomplicated cholesteatomata in the attic or antrum, it may perhaps suffice,—as was mentioned by Hartmann during the Congress of Berlin—to produce, by removal of the pars ossea and the lateral wall of

the antrum, and by epidermization of this opening, a permanent opening in the posterior wall of the external meatus, through which the cavity may be conveniently inspected. Relapses should also here be expected.

On the other hand, in most cases of cholesteatoma of the temporal bone, extending beyond the antrum, and frequently complicated with caries and necrosis, an enormous cavity is found, which has developed by the growth of the cholesteatoma at the expense of the bone, and is completely filled by cholesteatomatous masses, which are disintegrated in the centre, and extremely offensive. Its walls are partly lined with a smooth, glossy layer of epidermis, partly occupied by more or less extensive areas of caries or necrosis; the septic destructive process has frequently still further extended into the cerebral cavity, leading to sinus-thrombosis, sinus-phlebitis, subdural abscess, and cerebral abscess. There exists, therefore, a vital indication for the operation. Nature has in some of these cases shown us the way to suitable treatment; viz., the anterior or the lateral wall of the mastoid is frequently perforated by fistulæ or the posterior wall of the external meatus (and simultaneously the anterior wall of the mastoid) have entirely or partially succumbed to the destructive influence of the cholesteatoma and the suppuration, so as to enable one in such cases to inspect from the external meatus the spacious cavity. I have never seen under such conditions a spontaneous cure take place, while I remember to have observed this in some cases in which, apart from the posterior wall of the external meatus, the lateral wall of the process was also destroyed, so as to present two spontaneous openings, through which, on the one hand, the secretions and the cholesteatomatous masses were discharged, while, on the other hand, free circulation of air was established. Partly following these observations, partly for practical reasons, I have, in these cases of cholesteatoma, tried to produce a *permanent opening toward the external meatus as well as in the lateral wall;* I consider this method to be superior for after-treatment, and safer against relapses, and I agree with Siebenmann[1] that, in order to produce per-

[1] *Berl. klin. Wochenschr.*, 1893, No. 1.

manent epidermization, the access of air to a cavity with rigid walls should be as unimpeded as possible.

For, after complete epidermization of the cavity, now rapidly, now slowly, an excessive production of epidermis (hyperkeratosis) almost invariably takes place. Whitish-yellow membranes are cast off from the walls. The underlying bone is again lined with a thin layer of epidermis, which is also cast off after some time, until finally the entire cavity is filled with membranes. While in a cavity which had remained open only toward the external meatus *I have always seen, sooner or later, suppurative disintegration of these membranes, followed by the return of otorrhœa, I have in the permanent retro-auricular opening observed this disintegration in one case only.* All my cured cases are re-examined regularly. Even in retro-auricular opening, it is true, the above-mentioned white membranes, which by mixture with cerumen are stained brown, are formed (in some cases more frequently, sometimes but once in three years); nevertheless, the disintegration of these membranes with re-establishment of the suppuration can now more readily be prevented, since the patients or their relatives are enabled to remove the membranes, which is impossible in the case of cicatrized wounds behind the ear. Apart from these reflections, practical reasons have induced me to establish permanent retro-auricular openings.

In order to secure positive success, great importance is to be placed upon the operation as well as upon the after-treatment, which is under certain conditions still more difficult than the operation, and, which in some cases, fails of the desired success, if the retro-auricular opening is allowed too early to become smaller or close entirely. Firstly, those cases with very narrow ear canals do not permit the very painful and protracted after-treatment through the external meatus. Secondly, as it is well known to every one who has observed such severe cases of cholesteatoma, there is frequently connected with cholesteatoma a more or less extensive caries of the walls of the cavity. Small carious spots, which are situated with predilection upon the walls of the antrum, or upon the passage from the tympanum into the auditus, and which, later on, when

the posterior openings of the wound are permitted to close, lead to fistulæ, may escape even the most practised eye in spite of the greatest care. One is then compelled either to reopen or to enlarge the wound behind the ear, or to treat the diseased osseous portions from the external meatus, frequently by the sense of touch only, and that too at a dismal depth and with important organs in dangerous proximity. The old proverb, "*tuto, cito et jucunde*," is well adapted to this condition.

Some patients, whom I had the opportunity to present this year at the Otological Congress at Bonn, exhibited the above-mentioned conditions. It was indeed very difficult to invest the diseased osseous parts (medial wall of tympanum and antrum), which were covered with granulations from the adjoining parts, with an epithelial layer; the patency of the lateral opening greatly facilitated the treatment of these places by the extensive but careful use of the sharp spoon.

In a case of extensive disintegrated cholesteatoma, treated by retro-auricular opening, with a fistula in the posterior wall of the external meatus, leading into a large cholesteatomatous cavity, with sinus-thrombosis and necrosis of the sinus wall, I observed, twelve months after the operation and six weeks after complete epidermization of the entire large cavity, the sudden development of a fistula, which led toward the sinus, and, if the opening behind the ear had been closed, at any rate would have: (1) produced a relapse of the otorrhœa; (2) not been discovered so quickly, so that there would have been greater danger to the life of the patient; (3) required re-opening of the mastoid process.

Since it is too painful to keep the lateral opening by plugging, cauterization, and other means alone, during the entire duration of the after-treatment so far patent, as is necessary for convenient inspection, I try to retain from the beginning permanent patency of the retro-auricular opening. I accomplish this either:

1. By implantation of broad-based cutaneous flaps from the scalp (formation of flaps by Schwartze's method, which has proven itself to be excellent);

2. By Thiersch's transplantations; or,

3. By cutaneous flaps from the posterior surface of concha.

Before I enter more fully into the discussion of the flap formation, it may be appropriate to repeat *the description of the method of operating for cholesteatoma* [1]*:*

I perform at first the typical chiselling of the antrum according to Schwartze, then detach the cutaneous external meatus in its upper and posterior portion by means of the raspatory, and sever it transversely as closely as possible to the membrana tympani, without injury to the lower and anterior wall, to which point especial attention has to be directed, since for after-treatment the largest possible field of intact epidermis is required. The detached wall of the external meatus is then horizontally incised in its upper portion and the flaps are attached upward and downward by means of hooks, after careful stoppage of hemorrhage. I have now two osseous canals converging towards each other: (1) the osseous external meatus, as in the skull; and (2) the artificial osseous canal; the former leading into the tympanum, the latter into the antrum. The osseous bridge between them (posterior osseous wall of the external meatus) is then chiselled off in layers from without inward, the facial nerve at bottom being protected by a bent silver probe (or Stacke's protector). Of the upper wall of the external meatus also so much is taken off as to freely expose the attic and the aditus ad antrum. Still existing remnants of malleus, incus, membrana tympani, and also the cholesteatomatous masses, may be readily removed from all niches and corners. The use of the sharp spoon has been limited of late to the removal of granulations and portions of bone infiltrated with pus; by all means I spare the lining membrane of the cavity and avoid general scraping of the walls of the cavity, since I found that in this way healthy epithelium is taken off with the diseased one, where one's aim is directed to produce epidermis. One cavity is thus formed, which consists of external meatus, tympanum, attic, aditus, antrum, and mastoid pro-

[1] We may refer to an instructive paper entitled "Antrectomy as a Treatment for Chronic Purulent Suppuration of the Ear," by W. Arbuthnot Lane, of London, published in these ARCHIVES, vol. xxi., p. 118, etc., 1892.—H. K.

cess. All depends upon keeping this cavity as widely open as possible. How do we attain this object?

1. By flap formation according to Schwartze (*cf. Archiv f. Ohrenheilk.*, vol. xxx., p. 256). The flaps are formed according to the size of the wall of the cavity to be covered by making a parallel incision about 2 *cm* behind the original cutaneous incision, and by detaching portion of skin so limited; they should not be too thick at the external margin; their base is best located upward and is formed, according to Stacke's method, from the posterior cutaneous wall of the external meatus as a single flap, which is turned downward; one may also form another flap with the base located below. The formation of flaps from the posterior and upper cutaneous wall of the external meatus, by Stacke's method, assists in covering the uncovered portions of the cavity with epidermis.

2. By flap formation according to Thiersch, as first proposed by Siebenmann for cholesteatomatous cavities. As to the technical execution, I refer to the elaborate descriptions of the method in Siebenmann's above-mentioned paper (*Berl. klin. Wochenschr.*, 1893, No. 1), and to the description of Urban (*Deutsche Zeitschr. f. Chirurgie*, vol. xxxiv.). The assertion of Af Forselles of Helsingfors (*Archiv f. Ohrenheilk.*, vol. xxxvi., p. 145), that Schwartze's method of bringing healthy epidermis into the tympanic cavity can never be replaced by Thiersch's transplantations, I cannot allow. I consider the method as well applicable, when correctly carried out, and recommend it to my colleagues for further trial, since it enables us to lessen essentially the long duration and painfulness of after-treatment. One should not be deterred by failures in the beginning.[1]

I have found, however, that this method is not adapted to all cases. Since the extremely thin cutaneous flaps cannot be readily placed everywhere, they require for their insertion the largest possible lateral opening; those cases, therefore, in which the attic and antrum only are opened

[1] In cases where a complete epidermization is not intended, mucous membrane taken from the lip, as in Van Milligen's distichiasis operation, might be placed on the medial surface of the antro-tympanic cavity.—H. K.

from the external meatus are to be excluded. But in wide cavities small flaps may be placed into the antrum, aditus ad antrum, and tympanum, where the bone is deprived of its mucous membrane and is not as yet covered with epidermis; one has in this way—although not all flaps attach by healing—always one or several islands of epidermis just at the remotest places, whereto epidermis could otherwise not be brought without the greatest trouble, loss of time, and even pain.

3. By flap formation from the posterior surface of the concha. By this well tried method one prevents the subsequent growth of hair into the cavity, which, in flap formation from the scalp, particularly in women, is frequently very inconvenient. One should form the cutaneous flap in the beginning of the operation by cutaneous incisions made down to the cartilage 1 *cm* behind the external margin of the concha; then dissect the flap up to the mastoid process, placing its largest side upon the upper angle of the wound; and finally make the typical parallel incision behind the concha down to the periosteum.

The cutaneous defect of the concha may be covered by Thiersch's transplantations. The newly formed large cutaneous flap is attached by a stitch during the operation to the skin of the occiput and covered with moist sterilized gauze; after the formation of the cavity the flap may be formed according to the size of the surface to be covered, or divided into several portions. An advantage for the future of the operated person consists in the permanent closure of the tympanal ostium of the Eustachian tube; for by discharge of secretions from the tube into the tympanum mucus readily gathers at the bottom, while the tympanum remains dry when the ostium tubæ is closed. Cosmetic considerations against the patency of the retro-auricular opening are of little moment when compared with the severity of the affection and the seriousness of an eventual relapse. In the majority of cases there exists a vital indication for the operation. My patients (even ladies) all get used to the opening, which is covered by arrangement of the hair, and into which a small piece of cotton

is loosely placed. A protecting plate could be dispensed with even during the severest labor; for particularly large openings, however, especially for those which cannot be covered by hair, a pad is to be recommended. In the five cured cases which I presented at Bonn, there existed extensive cholesteatoma of the petrous bone, complicated with caries, necrosis of the wall of the sinus, tuberculosis, sinus-thrombosis, pachymeningitis, facial paresis, vertigo, headaches, vomiting, facies Hippocratica; thus all had been operated on account of a vital indication. All cases present a retro-auricular opening. The duration of treatment up to the complete epidermization of the cavity and the permanent opening lasted from two to nine months; the duration of cure without recurrence of suppuration (certified to by constant observation) lasted from six months up to four years!

ON BINAURAL HEARING.

By Dr. EMIL BLOCH, of Freiburg in Baden.

Translated in abstract by Dr. Ward A. Holden.

BINAURAL audition has not been a frequent subject of physiological study, yet the opinions of different experimenters have so differed on important points that many questions are far from settled.

My first experiments were in regard to the phenomenon described by Le Roux, of the increase in tone sensation with binaural conduction. If two forks in unison are struck and one held before each ear, a tone of extraordinary strength and fulness is perceived. If both forks are held before one ear, the perceived tone is weaker and thinner. If one fork is held before one ear and the second fork is gradually brought near the other ear, the sensation in the first ear is increased, and later a weaker tone is perceived by the second ear. When the second fork is brought so near that the two are heard with equal intensity, the tone is no longer heard in the ears but in the interior of the head, thus forming a subjective auditory field. This increase in intensity is also obtained when the forks are not quite in unison, and a slight increase will be observed when with one ear perceiving a tone, a noise is made before the other, while two noises in unison are heard very much louder.

These phenomena can be best studied by producing the desired tone in two telephones by means of Von Kries's electric siren. When the telephone discs vibrate in similar phases, the tone is perceived in the front of the head and has a sonorous character. When the discs vibrate in opposite phases, the tone is perceived in the depth of the head between the ears, and is rougher and rattling. A large series of experiments on different individuals showed that in

the great majority of cases the tone was located anteriorly when the phases were similar, and farther back in the head when they were opposite, though no satisfactory explanation of this phenomenon can be given.

The great increase in the intensity of the tone perceived has been explained by some as a simple addition of the two monaural auditory impressions, while others have conceived another factor to be present. Urbantschitsch believes that binaural audition exceeds monaural in that, besides the excitation from the external source of sound, a central subjective excitation is added, increasing the intensity of the sound perceived.

The phenomenon of the increased intensity of the sound when perceived with both ears, may be used as a test of unilateral deafness and of simulated unilateral deafness.

The most important function of binaural hearing is the recognition of the direction of sound. In my experiments in this respect the Politzer acoumeter was used. The first tests were made in a horizontal plane. The instrument was sounded once and then moved a short distance and sounded again, the person experimented on saying whether the second sound came from a point to the right or the left of the first.

The results showed that the accuracy of location gradually diminishes when from a point before the individual we pass to either side, being least at 90° and 270°, and increasing to a second maximum at 180°, which, however, is not so great as at 0°. The same results were obtained when an instrument giving a lower and more sonorous tone was used.

With one ear closed the instrument has to be moved, from directly forward, 30 *cm* for the change of position to be appreciated, while a change of 6 *cm* was recognized with both ears open. Here the accuracy of location gradually decreased, having its minimum between 180° and 270°, the position and shape of the auricle doubtless having an influence.

Experiments in a frontal plane showed the accuracy to be equally great above and below and diminished at the sides. With one ear closed a similar relation was found.

Experiments in a sagittal plane showed the accuracy of location to be less here than in any other plane, and excepting a reduction behind there was no regularity about the table.

A number of experiments made with the auricle held in an abnormal position by strips of plaster, showed in general that when the sound waves are not received by the auricle and carried into the canal, the accuracy of localization in a sagittal plane is very poor in those parts where it is ordinarily greatest. The lower portion of the auricle normally renders more difficult the entrance into the ear of waves coming from behind and below. The auricle is then arranged for the conduction of waves from in front. And recognizing its important influence in certain auditory functions, as the experiments of Kessel and my own have shown, we are no longer forced to regard the auricle as a purposeless rudiment of an organ which in the process of evolution has lost its function.

The quality of a sound has an effect on our judgment as to its direction. Loud and sustained tones of moderately high pitch are localized with greater accuracy than the softer and less sustained, and we are inclined, other things being equal, to project a weaker sound backward, and a louder one forward.

Experiments on the judgment of the distance of the source of sound showed that it was impossible to lead the patient astray by giving a greater intensity to the distant sound, and a lesser intensity to the nearer. But it was found that if the fork was held somewhat higher than the head, so that some of the overtones were lost, the flatter sound thus heard always seemed to come from a greater distance, this showing that our judgment of the relative distance of two sources of sound does not depend so much on the intensity of the tone as a whole as it does upon the intensity of the perception of the individual tones making up the whole tone.

The characteristics of binaural audition may be summed up as follows:

1. With binaural conduction of a sound there is an alternating increase in the auditory impression (Le Roux).

2. This increase grows less as the two auditory impressions become more dissimilar.

3. It depends probably not only on the addition of the bilateral acoustic excitation and the transference of the perception to the interior of the head, but also on an actual central increase of excitability (Urbantschitsch).

4. With the binaural conduction of a tone or a noise into the auditory canal, or in its neighborhood, the sound is heard in the head (Thompson; subjective auditory field of Urbantschitsch).

5. The subjective auditory field lies on the side of the stronger perception. By changing this, the location of the field may be altered at will.

6. Its location in the median plane and the perception of the character of the tone depend upon the relations between the phases of the sound waves on each side.

7. The most important function of binaural hearing is the recognition of the direction of sound.

8. This is more perfect in the horizontal and frontal planes than in the sagittal.

9. In the two former it depends chiefly upon the comparison of the intensity of the sound perception on both sides, and in less measure on the influence of the auricle on the conduction of the sound waves to the canals.

10. In the sagittal plane the last factor alone comes into play.

11. Different characteristics of the sound, such as its duration, intensity, and timbre, influence our judgment of the direction, particularly in the sagittal plane, corresponding to the more frequent excitation of the auditory nerves and the repeated experiences of daily life.

12. In the estimation of the distance of a sound we judge less from the total intensity than from the intensity of the component single sounds.

13. The judgment of the direction of sound with one ear alone is very poor.

14. It does not seem necessary, in judging of the direction of sound to take into account any other than the physiological and psychological factors here discussed.

A CASE OF EXTERNAL PACHYMENINGITIS OF AURAL ORIGIN CURED BY TREPHINING.

By Dr. A. GUYE, in Amsterdam, Holland.

HOFFMANN'S[1] statistics, published in 1888, show that in three fourths of the fatal cases of aural disease there was external pachymeningitis, passing over into leptomeningitis, cerebral abscess, or sinus-phlebitis. Hessler[2] and Körner[3] have arrived at a similar conclusion. It is evident, from many clinical and pathological observations, that, when there is a carious process in the middle ear, an external pachymeningitis may readily develop. Can the same process occur when, after paracentesis of the drum-membrane and chiselling out of all the affected portion of the mastoid, the inflammatory process in the ear is cured and has run its course with a restitutio ad integrum?

The following case seems to be of importance in answering this question.

P. H. S., æt. sixteen, consulted me on Nov. 24, 1892. From childhood he had frequently had inflammation of the middle ear, with chronic naso-pharyngeal catarrh, and occasional otorrhœa, and was quite deaf in the right ear. Six months before, his hypertrophied tonsils had been removed. Now for two weeks, perhaps from influenza, there had been pain in the left ear with evening exacerbations. Hearing, for whisper, R 0.10, L 0.40 *m.* Ordinary conversation, R 0.20, L 1. *m.* Drum-membranes fairly normal. Left mastoid very sensitive. After removal of the pharyngeal tonsil and politzerization, L, ordinary speech, 4 *m.*

[1] *Deutsche Zeitschr. f. Chirurgie*, vol. xxviii., p. 458.
[2] *Arch. f. Ohrenheilk.*, xxxiii., 81.
[3] *The Otitic Diseases of the Brain*, etc., Frankfort, 1894.

As the improvement was only transitory, a paracentesis was made two days later through which the air passed freely. Three days later the wound was healed, but the mastoid was still very sensitive, and a second paracentesis was made. From this time on the hearing in the left ear remained normal. But as the mastoid remained tender and there was fever every evening, the mastoid was opened Dec. 4th. A layer 1 *cm* thick was removed from the entire mastoid, and behind and below I found a deep round cell full of pus and granulations. These were removed with the sharp spoon, but no communication with the tympanic cavity was found. The wound was plugged with iodoform gauze, and the course was normal under the usual after-treatment. Five weeks later the patient was discharged cured with normal hearing in the operated ear. Four weeks later he returned complaining of having had occipital pain and evening fever for two weeks, and a very tender spot on the skull 5 *cm* behind and above the ear. The mastoid scar was normal, as was also the drum-membrane. Hearing normal. Some remnants of the pharyngeal tonsil were removed, and politzerization was done, but the headache persisted, and I came to the conclusion that inflammatory germs had spread from the mastoid abscess farther into the diploë of the skull, remaining latent while the wound was open, but had become active since its cicatrization, and now threatened to lead to external pachymeningitis and eventually to an epidural abscess.

I examined the patient several times in consultation with Dr. Delprat and Professor Korteweg, and proposed to the latter, as the condition remained the same, to trephine the skull at the sensitive spot and determine whether there was not an extradural abscess there. The patient was therefore received in Professor Korteweg's wards, and while there showed, from March 2d to March 8th a daily evening rise of temperature to 37.8°–38°. The ophthalmoscopic examination by Professor Gunning gave a negative result.

The presence at the same time of some erysipelas cases in the wards was the reason for the operation being deferred so long, there being no danger from delay in this case.

The patient went home for some weeks, and then was again received into the hospital and placed under observation. The pain was unaltered, the same spot remained sensitive to pressure and percussion, and the temperature, while lower, still reached

37.5° to 38° in the evening. Finally, upon April 28th, after the condition had lasted two months and a half, the patient was trephined by Professor Korteweg. An oval flap of skin was detached and turned forwards, and a circular button of bone, 3 *cm* in diameter was removed by the trephine. Beneath this *the dura was found to be pretty normal, with no very marked hyperæmia.*

The button of bone was put back and the wound closed. The wound healed without suppuration ; the patient was kept in bed three weeks, and after the operation had no longer any elevation of temperature or headache. Indeed, except for a slight supra-orbital neuralgia upon the same side during the first ten days, there was complete euphoria. I saw him on May 26th, July 18th, and Sept. 2d. Then he returned to school, and on Dec. 13th I presented him at a meeting of physicians in Amsterdam. Since the operation he has remained perfectly well.

There are two questions in regard to this case which I may enter into. The first, already mentioned, is whether a pachymeningitis externa can develop after the inflammatory process in the antrum has run its course, and when there is no longer any pus in the middle ear. In my opinion the course of the case and the result of the trephining give an answer to this question. To be sure there was no marked pachymeningitis, and not even a semblance of an extradural abscess, but there was an ostitis, which, in my opinion, would, if it had been left to itself, have given rise to an extradural abscess. And the second question, which really depends upon the first, is: Was there a sufficient indication for trephining? This question, too, is answered by the favorable result of the operation. Trephining, when done by a skilled hand and with scrupulous antisepsis, I regard as an operation comparatively free from danger. The favorable result, in my opinion, is analogous to that which we often get in chiselling away a part of the mastoid process when not a drop of pus is found. Schwartze some years back called these cases by what seems to me the not very happily-chosen name of "neuralgia mastoidea." And Buck, at a meeting of the American Otological Society, described briefly a series of such cases. He gave his paper the curious title of "The Strongly Counter-Irritant Effects of the Usual

Mastoid Operation "[1] and Knapp made upon it the very correct observation that he did not know how to conceive of a counter-irritation in this sense. In many cases we have simply a congestive mastoiditis, and the result is almost always satisfactory. Two years ago I operated upon a lady in whom, after repeated paracentesis and careful treatment, pain in the mastoid process with irregular fever persisted. In the first operation the mastoid process was chiselled pretty deeply without pus being found. While the wound was healing and for some weeks later, the patient appeared cured, and then the old symptoms, namely, spontaneous pain, sensitiveness to pressure and percussion, and evening rise of temperature, recurred.

About two months after the first operation I chiselled away what was left of the mastoid process, consisting mainly of its tip, and, as before, found no pus whatever. But after the second operation the patient was cured, and no relapse occurred.

The cranitis in our case occupies the same category as Knapp's "Congestive Mastoiditis," which, as excessive hyperæmia is not always to be found, I would prefer to call *mastoiditis sicca.* That this cranitis would have caused pachymeningitis later on is very probable, since the antecedent mastoiditis was a suppurative one. Considering the great probability of this and the serious consequences which were to be apprehended if the disease were allowed to run on, the operation of trephining was, in my opinion, justifiable, and I believe that I may feel sure that in this case a pachymeningitis externa was aborted.

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[1] *Journal of Laryngology, Rhinology, and Otology*, Dec., 1893. p. 601.

REPORT ON THE PROGRESS OF OTOLOGY DURING THE SECOND HALF OF THE YEAR 1894.

I.—NORMAL AND PATHOLOGICAL ANATOMY, HISTOLOGY, AND PHYSIOLOGY OF THE EAR AND NASO-PHARYNX.

By Prof. AD. BARTH, Marburg.

Translated by Dr. A. Duane, New York.

A.—ANATOMY.

a.—ORGAN OF HEARING.

1. Howe. Upon the comparative anatomy of the ossicles. *Trans. Amer. Otol. Soc.* (26th annual meeting), vol. v., part 3, 1893.

2. Tomka, S. A case of supernumerary ossicle in the drum-cavity of man. *Wien. Med. Wochenschr.*, No. 44, 1894.

3. Randall, B. A. Statistical studies of the foramen of Rivinus and of the axis of the external canal, in their relation to intra-tympanic surgery. *Trans. Amer. Otol. Soc.*, vol. vi., part 1, 1894.

4. Randall, B. A. Can important topographical relations of the temporal bone be determined from the form of the skull?—as answered in part by five hundred skull measurements. Arch. of Otol., July, 1894.

1. Howe's researches showed that in the mammalia the long process of the malleus sometimes remains through life as a distinct bone, retaining thus the relation which exists in man in the embryonic stage. While in many of the higher animals the mechanism of the incudo-malleal joint is like that existing in man,

it is essentially different from the latter in the bear, armadillo, guinea-pig, and others. The shape of the malleus and incus often varies considerably in orders that are nearly allied, while the stapes showed great similarity in all classes.

2. TOMKA, out of many ears which he examined, found one in which there was a supernumerary ossicle situated in the upper portion of the tympanum, to the inner side of the incudo-malleal joint. The latter was normal both as regards shape and mobility. The case is unique in literature.

3. RANDALL in summarizing his results says: "In the vertical plane the canal was found to run in this series invariably upward, unless the downward trend of its innermost part be unduly considered,—the angle varying from 5° to 17°. More than one third of the cases (right 36, left 39) showed inclination of 10°; and the angles above and below this were about equal in number and degree—giving an average of 11.37° for the right and 10.9° left. Differences between the two sides were rarely marked, the maximum of 4° right or 5° left being exceptional. This accords with my previous findings, which in this mensuration were fairly accurate. In the horizontal plane, the result was closely similar. An inclination forward of 10° was nearly as frequently found (31 right, 30 left), and the averages were 9.99° and 8.94°, respectively. Difference between the two sides was less rare, but never exceeded 7°, yet the limits of variation in different skulls were much wider, reaching from a maximum of 20° not only to the 0 point, but in one skull at least giving a backward inclination of 2°."

In regard to the visibility and accessibility of the stapes and oval window, RANDALL found in 100 cases that the stapes was present 40 times and that it was freely visible in 9, partly concealed by the annulus in 22, and in 9 quite hidden. In the remaining 160 cases, the empty oval window was freely visible in 4 (14 per cent.), partly visible in 13 (45 per cent.), and hidden in 12 (41 per cent.) of those showing inclination less than 10°, while in those of more than 10°, 26 (39 per cent.) were visible, 34 (48 per cent.) partly, and 9 (13 per cent.) wholly concealed. The writer concludes that while the forward inclination of the auditory canal is not without influence, the visibility and accessibility of the stapes region is least through the horizontal canal and greatest through that which slopes most markedly upward.

As to the presence of the foramen of Rivini, Randall found

that out of a total of 260 drum-heads, there were 65 with the foramen (+ 25 doubtful cases), or exactly 25 per cent.

Among 47 children, not over fourteen years of age, the foramen was bilaterally present in but 2, on the right side alone in 3, and on the left side alone in 2; in all, 9 cases among 94 drum-heads. G. BACON.

4. RANDALL concludes his paper by saying: "That safe or dangerous relations, with maximum or minimum dimensions of the intervening structures, may be found on either side and in any type of skull. The drill and trephine must be regarded as distinctly less safe than the chisel. The lateral sinus may lie directly in the usual operating tract, and be so superficial that it may be discerned through the thin bony covering. The upper posterior margin of the auditory meatus with its spina (which was lacking in but 5 among 200 temporals, each time on the right) constitutes the most reliable guide to the point of entry, since among more than 1100 temporals I have never found the middle cerebral fossa to extend lower than this, and the sigmoid sulcus almost never so far forward. The antrum ought to be met at a depth of less than 20 *mm*, and deeper penetration is rarely safe, although my measurements would indicate that the facial canal and external semicircular canal lie never less than 16 *mm* from a point 5 *mm* behind the spina." G. BACON.

b.—NASO-PHARYNX.

5. KALISCHER O. On the nerves of nasal polypi. *Arch. f. Laryng. u. Rhinol.*, vol. ii., p. 269, 1894.

6. GAREL, J. Two cases of congenital anomaly of the anterior pillar of the velum palati. *Rev. de Laryng.*, etc., p. 489, 1894.

7. SCHEFF, G. Contributions to the theory of the anatomy and physiology of the nose. The path of the air current in the nose. *Internat. klin. Rundschau*, Nos. 40 and 42, 1894.

5. KALISCHER stained the tissues with methylene blue and fixed the stain with ammonium picrate. It was thus proved that it is by no means rare for nerves to occur in polypi, but that their number in any single case is very small. They form slender fibres with narrow, oblong, often irregularly nodular nuclei. From their form and course they must be classed with the nerve-fibres of new formation. No ganglia cells nor terminal corpuscles could be found, nor could it be made out that the nerve-fibres passed into the epithelium.

6. GAREL describes two cases of perforation of the anterior pillar of the fauces; one on the right side, the other bilateral. The fissures were regarded as congenital.

7. SCHEFF states, as the result of his researches upon cadavers, that in breathing the air-current passes mainly through the middle meatus of the nose, and that consequently we cannot, from a physiological standpoint at least, make a distinction between a regio olfactoria and a regio respiratoria.

B.—PHYSIOLOGY AND PHYSICS.

ORGAN OF HEARING.

8. EWALD, J. R. On the physiology of the labyrinth. The hearing of pigeons deprived of the labyrinth. *Arch. f. d. ges. Physiol.*, vol. lix., p. 258, 1894.

9. WUNDT. Is the auditory nerve susceptible of being stimulated by sonorous vibrations directly? *Philos. Studien*, vol. viii., 1893.

10. BEZOLD, F. Investigations concerning the average hearing power of the aged. ARCH. OF OTOL., July, 1894.

11. ZWAARDEMAKER, H. The presbycusic law. *Ib.*, July, 1894.

8. EWALD describes anew and circumstantially his researches upon doves deprived of their labyrinth, and states that so far every case which has been thus operated upon, and in which the operation has been properly done, reacts to sound—*i. e.*, presumably hears the latter. It seems, however, somewhat doubtful whether by his method the entire labyrinth is actually removed, and furthermore whether the deep tones which he used in testing the birds were not possibly appreciated by feeling rather than by hearing.

9. According to WUNDT, the theory of a specific nerve energy does not hold good for the auditory nerve—that is, each separate fibre of the latter appears capable of conducting all acoustic sensations, *i. e.*, those corresponding to all possible varieties of sounds.

10. BEZOLD gives the results of examination made of 200 ears of patients about fifty years of age. The following are some of the conclusions arrived at: "In the decades following that from the fiftieth to the sixtieth year there is therefore not only a suc-

cessive decrease in the number of those with nearly normal hearing, but there is also a successive increase in the degree of the deafness."

An examination as to the cause of deafness in old age showed "that the different sequelæ of former inflammatory processes are found in a much greater number from the fiftieth year on."

As to bone-conduction, "in age the middle-ear affections are less frequent as compared to inner-ear troubles," and "also in old age bone-conduction in itself does not experience a reduction, but sinks proportionally with the lessening of the hearing distance." G. BACON.

11. ZWAARDEMAKER'S conclusions are that:

1. The compass of the human hearing contracts a half octave at its upper limit up to the period of advanced old age. (Average a major fourth, maximum a major fifth.)

2. During advanced age proper, the contraction of the scale increases.

3. The upper limit is in youth at e^7, in advanced age at a^6 (average values). The extreme lower limit for normal hearing in old people is g^6.

A lower limit than this may be taken as a sign of pathological conditions. G. BACON.

II.—PATHOLOGY AND THERAPEUTICS.

By Dr. ARTHUR HARTMANN, BERLIN.

Translated by Dr. A. DUANE, New York.

MISCELLANEOUS.

12. HAUG, R. Contributions to the theory of the pathological anatomy and histology of the organ of hearing. One plate. *Beiträge zur pathol. Anat. u. zur allg. Pathol.* (Ziegler), vol. xvi., 1894.

13. HAUG, R. Reports of various cases from the aural department of the Surgical Polyclinic in Munich. *Münch. med. Wochenschr.*, No. 34 *et seq.*, 1894.

14. RANDALL, B. A. Treatment of ear disease by the general practitioner. *Philadelphia Polyclinic*, Oct. 27, 1894.

15. GRADENIGO, G. On monaural diplacusis. ARCH. OF OTOLOGY, Oct., 1894.

16. DAAE, H. On double hearing. *Ibid.*, Oct., 1894.

17. GRADENIGO, G. Aural sclerosis as a parasyphilitic affection in late hereditary syphilis. *Archivio ital. d'otol.*, etc., No. 4, 1894.

18. SCHMIDT, W. Upon the participation of the petrous bone (especially that portion comprising the ear) in fractures of the base. *Dissert.*, Marburg, 1894.

19. DUNN, J. A case of basal fracture. ARCH. OF OTOL., July, 1894.

20. WITHERS, O. Aural vertigo. *Brit. Med. Journ.*, June 2, 1894.

21. SZENES. Upon two cured cases of deafness. *Arch. f. Ohrenheilk.*, vol. xxxvii., p. 234.

22. AVOLEDO. Diseases of the ear among the pupils in the elementary schools. *Arch. ital. di otol.*, 1894, p. 13.

23. BENEDIKT. On the question of the exercise of the hearing in deaf-mutes and the deaf. *Berl. klin. Wochenschr.*, No. 31, 1894.

24. MOUNT-BLEYER, J. Tone-blindness and the education of the ear. *Med. Bulletin*, Dec., 1894.

25. ROBERTSON, W. Deaf-mutism : an examination of the Northern Counties' Institution for the Deaf and Dumb. *Lancet*, Sept. 8, 1894.

26. HUBBARD, W. H. Deaf-mutism. *Leisure Hour*, July, 1894.

27. MOOS, S. History of a brain-tumor. ARCH. OF OTOL., Oct., 1894.

12. HAUG found : (1) On the tragus of a girl ten years of age a supernumerary nipple with abundant papillæ, glands, and smooth muscular fibres. (2) Aspergillus nigrescens was found in a case of otorrhœa occurring in a woman of thirty-four. (3) A granulation-polyp of the middle ear was found to contain hairs, obviously introduced from the outside, and surrounded by numerous foreign-body giant-cells. (4) In a woman of forty-two, from whose middle ear a polypus supposed to be fibromatous had been removed half a year before, a melanotic giant-celled sarcoma developed, which filled the auditory canal and middle ear, displaced the Eustachian tube, and occupied the entire temporal region as far as the molar arch. (5) Two cases of "circum-

scribed nodular tuberculosis of the auricle," in addition to three previously observed, are described. Macroscopically these might readily be confounded with fibromata, but microscopically, both from the arrangement of the tissues and the presence of bacilli, their tuberculous character was rendered certain. Moreover, the presence of enlarged preauricular glands pointed to an infective process. Infection from outside is regarded as the most probable cause of the affection. BARTH.

13. HAUG reports a series of cases, appealing especially to the general practitioner. Practical remarks are appended to the full description given of each. The cases are: (1) *Foreign body* (glass-bead) in the external canal driven by unskilful attempts at extraction into the tympanic cavity; consequent fever, vomiting, and otorrhœa, which all disappeared after removal under an anæsthetic. (2) *Fracture of the auditory canal* with rupture of the drum-membrane, produced by a blow upon the lower jaw; profuse hemorrhage from the ear; oblique laceration of the anterior wall of the canal with over-riding of the lips of the wound, and distinct crepitation when the jaw was moved. The laceration of the antero-inferior wall of the canal was continued over the limbus upon the drum-membrane up to and some distance alongside of the handle of the malleus; and there was a second laceration (probably due to contre-coup) starting in the postero-superior quadrant of the drum-membrane and extending into the postero-superior wall of the canal. Primary union. (3) A *tick* (Ixodes Ricinus) in the ear; occurring in a workman who had slept out in the woods. Extraction with forceps after the instillation of a sublimate solution. (4) *Paralysis of the chorda tympani* by the instillation of a 10 per cent. solution of carbolic acid in glycerin. The instillation, which was performed for an acute otitis media without discoverable perforation, was followed by sudden burning and pricking and by a sweetish taste over one-half the tongue, followed in half an hour by a furry sensation in the latter. The aural symptoms rapidly improved, but the unilateral paralysis of taste persisted. (5) *Emphysema of the drum-membrane and of the mastoid region* produced by a single application of the air-douche (at a pressure of about ½ atmosphere). The appearances produced were ecchymosis of the drum-membrane, and the formation of vesicles of the size of a pin's head or larger in its upper part and in Shrapnell's membrane together with the formation of an emphysematoms swelling of the

mastoid, which attained the size of a hen's egg. (6) *Primary syphilis of the ostium pharyngeale* of the Eustachian tube, produced by catheterization. Chancre on the ostium demonstrable by posterior rhinoscopy. (7) *Perichondritis of the auricle* cured by repeated aspiration. (8) Acute purulent otitis media with empyema of the mastoid, the direct *result of a carelessly employed nasal douche.* Typical case. MÜLLER, Stuttgart.

14. RANDALL advises the general practitioner to pay attention to the treatment of the nares and posterior nares with atomizer and alkaline solutions. Afterwards, application to vault of pharynx of 2 per cent. glycerite of iodine by means of cotton on holder. In some cases, a spray of albolene with menthol camphor 2.5 per cent. should be used, and dusting the nares with calomel is recommended where inflammatory trouble is present. The external auditory canal should be thoroughly cleansed by syringing, peroxide of hydrogen being necessary in some cases. The insufflation of boric acid powder advisable in purulent cases, pneumatic massage and Politzer inflation in catarrhal cases, and inunction with yellow oxide of mercury in furuncle or eczema of the auditory canal. G. BACON.

15. Two cases are reported by GRADENIGO, one of a musician, aged twenty-nine, a violinist and composer, who had catarrhal otitis media. No symptoms of disease of the internal ear. The second case was that of a woman, aged twenty-eight, with catarrhal otitis media (both sides) with involvement of the internal ear. The forks c^3, c^4, c^5 were heard double. G. BACON.

16. The results arrived at by DAAE are that double hearing may arise :

I.—From affection of the sound-conducting apparatus.

II.—From affections of the sound-perceiving apparatus.

III.—That in a few cases where double hearing has been declared to depend on affections of the perceiving apparatus, the real affection was in the middle ear, treatment of which caused the double hearing to diminish or disappear.

IV.—That harmonic as well as discordant double hearing may depend partly on affections of the inner, partly on affections of the middle ear. G. BACON.

17. According to GRADENIGO, aural sclerosis due to syphilis affects especially the sound-conducting apparatus, but does sometimes affect the sound-perceiving apparatus as well. The aural affection may be the only evidence of the diathesis, and then the

diagnosis may be made from proofs afforded by the parents or the brothers or sisters. Keratitis or symptoms on the part of the teeth are frequently present. Prognosis unfavorable.

GRADENIGO.

18. SCHMIDT, in discussing the subject of fracture of the base of the skull with involvement of the ear, adduces 69 cases from literature and 10 additional ones observed in the Marburg Polyclinic. The result is a renewed confirmation of the fact that no certain conclusions with respect to the anatomical situation, the gravity, or the subsequent behavior of the fracture can be drawn from the external appearances in the ear and from the functional disturbances. The impairment of hearing in some cases is such as would indicate a lesion of the middle ear, in some others a lesion of the inner ear, but in most a lesion of both together. Subjective noises are very pronounced and sometimes are marked upon the non-affected side. Disturbances of equilibrium and vertiginous symptoms are rarely absent, but it is not certain from the author's statements whether these phenomena may not be the direct result of the severe primary lesion of the skull itself. Facial paralysis was found in 44 out of the 79 cases.

ZIMMERMANN.

19. DUNN reports the case of a farmer, aged fifty-six, who was thrown from a wagon and who was at the same time struck by a barrel of flour on the right temporal region. There developed complete paralysis of the fifth, sixth, and seventh nerves of the right side. Drumhead normal; slight diminution of power of hearing in the right ear; slight tinnitus. The condition of the patient was unchanged when seen five months later.

G. BACON.

20. In connection with the attention which has recently been directed to the subject of auditory vertigo by the papers and letters of Dr. Stephen Mackenzie, Sir William Dalby, and others, Dr. WITHERS of Sale, Cheshire, writes to advocate the employment of venesection in those cases in which the vertigo is obviously the result of increased arterial tension and symptomatic of impending apoplexy. Dr. Withers relates some striking particulars of a case in which prompt venesection was followed by immediate benefit.

SILK.

21. SZENES reports the case of a child who two weeks before it came under observation had been affected with earache and transient discharge. Constant diminution of hearing in spite of

inflation until, in the course of four weeks neither the watch nor the tuning-fork was heard either by air- or bone-conduction. After the employment of seven injections of pilocarpine the hearing suddenly returned and remained unimpaired. This result is attributed to the pilocarpine. But the author likewise adduces a case in which the hearing was restored by rest alone. This was in the case of a man of sixty with atheromatous vessels, in whom sudden deafness set in accompanied by vertigo and vomiting. The hearing returned in the course of thirty-six hours, but the vertigo persisted at least ten days. RUMLER.

22. AVOLEDO gives an interesting statistical statement of his examinations made upon pupils in the elementary schools, and confirms the results before obtained with regard to the frequency of ear disease among them. GRADENIGO.

24. In this paper MOUNT-BLEYER gives an account of the science and study of acoustics from the earliest times, and dwells especially on the importance of a study of the laws of acoustics in their relations to aural science. He speaks of the phonograph as an aid to precision and of its value as an ear educator ; also of the training of the ear, and concludes with remarks on the training of the voice and study of music. G. BACON.

25. In this paper, which is accompanied by a series of fourteen elaborate statistical tables, ROBERTSON expresses the following opinions, viz. : (1) That scarlet fever and brain disease are the most common causes of deaf-mutism. (2) That in the majority of the scarlet-fever cases the deaf-mutism is probably the result of an affection of the internal ear. (3) That cerebro-spinal meningitis is the most common cause of cerebral deaf-mutism. (4) That in the majority of cases the deaf-mutism develops before the end of the third year. (5) That a very large proportion of deaf-mutes may be said to have normal middle ears. (6) That catarrh and hyperplasia of the mucous membranes adjacent to the ear are present in an abnormal number of cases. (7) That cases of total deafness are more common among those in whom the deaf-mutism is acquired than among the congenital deaf-mutes, and that more than one half of all cases are totally deaf. (8) That inheritance, consanguineous marriages, etc., play an important part in the production of this condition. SILK.

26. Dr. HUBBARD has published in pamphlet form the paper on deaf-mutism written by him for the *Leisure Hour* in July, and the statistics, given in popular form, are of much interest to all

aural surgeons. It is satisfactory to learn from this paper that according to recent census returns the proportion of deaf-mutes to total population is diminishing. In 1851 it was as 1 to 1738, in 1891 as 1 to 2043. Among Jews the proportion appears to be rather higher than usual, the result probably of hereditary influences and consanguineous marriages. SILK.

27. MOOS gives a most interesting history of a patient, aged twenty-one, in whom the diagnosis of an affection of the cerebellum and medulla, probably a tumor (glioma), was made during life. At the autopsy, the tumor was found on the under surface of the cerebellum, involving also the outer part of the left half of the pons and the adjoining section of the crura of the cerebrum, and extending towards the medulla oblongata, and penetrating to the interior of the left hemisphere of the cerebellum. The tumor was found to be a primary, mainly small-celled sarcoma.

G. BACON.

INSTRUMENTS AND METHODS OF EXAMINATION.

28. SMITH, W. HARVEY. The application of the graphic method to hearing. *Med. Record*, Oct. 20, 1894.

29. SCHWABACH. Upon the diagnostic value of the tuning-fork tests, as deduced from observations made in a case of tumor of the base of the skull. *Berl. klin. Wochenschr.*, No. 43, 1894.

30. ALDERTON, H. A. Investigations with tuning-forks of middle register in over six hundred cases. ARCH. OF OTOL., July, 1894.

31. ZWAARDEMAKER, H. Hearing for speech and hearing for tones in general, and the measurement of the latter by Gradenigo's auditory field. *Arch. f. Otol.*, Oct., 1894.

32. GRADENIGO. Relation between the hearing-distance for the whisper and that for the watch, as a diagnostic sign in diseases of the ear. *Giornale della R. Acc. di Medic. di Torino*, Nos. 4 and 5, 1894.

33. CHEATLE, A .Aural auscultation-tube. *Br. Med. Journ.*, Sept. 22, 1894.

34. DE ROSSI. Upon some experiments with myringography and upon a new method of performing massage of the middle ear. *Arch. ital. di otol.*, p. 281, 1894.

35. WINGRAVE, WYATT. Self-retaining aural polypus-forceps. *Lancet*, Dec. 8, 1894.

36. LUND. Ear-syringe guard. *Lancet*, Sept. 29, 1894.

37. PLIQUES. Electricity in otology. *Annales des mal. de l'oreille*, etc., vol. ix., 1894.

38. WAGNER, H. L. Value of antroscopy. *Journ. Amer. Med. Assoc.*, Sept. 29, 1894.

39. AVELLIS. Description of a pocket-case for throat, nose, and ear specialists, and of a modified laryngeal mirror. *Arch. f. Laryngol.*, etc., vol. i., part 1.

40. KEIMER. A new handle for galvano-cautery loops. *Ib.*, vol. i., part 1.

41. MCDONALD, G. Universal nasal snare. *Lancet*, Dec. 1, 1894.

42. BOYD, STANLEY. A tonsillotome. *Br. Med. Journ.*, June 18, 1894.

43. KELLY, A. B. Tonsil-punch. *Lancet*, July 17, 1893.

44. GLEITSMANN, J. W. A new conchotome. *N. Y. Med. Journ.*, Dec. 15, 1894.

45. RANKIN, D. N. New serrated nasal scissors for the removal of hypertrophies and turbinated tissues. *Med. Record*, Nov. 17, 1894.

46. CHAPPELL, W. F. The annular septum-knife. *Med. Record*, Feb. 10, 1894.

47. GOLDSTEIN, SAM. A new uvulatome. *Ib.*, Sept. 8, 1894.

28. SMITH'S chart has been devised to provide the otologist with the means of representing the results of tuning-fork and other tests, so that the slightest deviation from the normal can be perceived at a glance, and the comparative differences between the aërial and bone-conduction, and the results of the acoumeter, the voice, and the watch tests can be readily appreciated. The hearing power is expressed in percentages, which are based upon the results obtained from the use of Hartmann's tuning-forks, the acoumeter, the voice, and the watch. G. BACON.

29. In a patient affected with an epithelioma starting from the sphenoidal sinus, SCHWABACH was able to test the value of the tuning-fork in the diagnosis of aural disease. The patient at the time of his entrance into the hospital had almost normal hearing, which, however, steadily decreased. From the result of examinations made with high- and low-pitched forks, using both Rinné's

and Weber's tests, Schwabach inferred the existence of an affection of the sound-conducting apparatus. This assumption was confirmed by autopsy. RUMLER.

30. ALDERTON presents the results of experiments extending over 1891 and part of 1892. Hartmann's series of forks were employed. G. BACON.

31. ZWAARDEMAKER'S results may be summarized as follows: 1. If Gradenigo's auditory field is completed and constructed according to physical laws, it furnishes an absolute measure for the acuteness of hearing. 2. For the construction of the auditory field five observations will provisionally suffice: lower boundary tone, C, c^2, $f\sharp^4$, and upper boundary tone. 3. For certain scientific examinations a more exact estimate of the auditory field will be required. G. BACON.

32. GRADENIGO'S conclusions are as follows: (1) The hearing-distance for the whispered voice may be affected to the same extent as that for the watch. This occurs especially in slight affections of the sound-conducting apparatus. (2) The hearing-distance for the whisper may be somewhat greater proportionately than that for the watch. This is the most frequent type in affections of the sound-conducting apparatus. (3) The whisper may be heard much farther, comparatively speaking, than is the watch. This occurs especially in affections of the internal ear. (4) The hearing-distance for the watch may be greater, comparatively speaking, than the hearing-distance for the whisper. This occurs in acoustic hyperæsthesia of an hysterical character.

GRADENIGO.

33. CHEATLE figures and describes a simple and useful form of apparatus designed for the comfort and convenience of both the surgeon and the patient. It consists essentially of two light metal springs, one of which passes over the vertex of the surgeon on a level with the external meatus, and the other is placed in a similar position on the patient. At the end of the spring nearest the meatus is a small catch, into which fits a nozzle of wood or bone, communicating by means of a rubber tube with the corresponding nozzle on the other spring; by this means the irritation which often results from the constant shifting of the nozzle is avoided. SILK.

34. DE ROSSI describes and figures an instrument devised by him, and designed for the transmission of the vibrations of a tuning-fork. A membrane, set in vibration by the tuning-fork,

transmits its oscillations through a column of fluid to another membrane, which necessarily vibrates in unison with the former, and which may be connected with a recording apparatus for indicating graphically the results. The author describes briefly some experiments which he made in this way upon man.

GRADENIGO.

35. In WINGRAVE'S polypus-forceps self-retention is secured by means of a cross-spring action rather than by a slide or a clamping-spring. SILK.

36. Messrs. Wright & Co., at the suggestion of Mr. LUND of Manchester, have devised a simple form of guard to avoid injuring the deeper structures of the meatus should the patient make a sudden movement. The nozzle of the syringe is cut into a screw upon which runs a small globular nut of metal; this nut being fixed at the required distance, the nozzle is passed through a hole in a band of metal held across the meatus by means of the disengaged hand. SILK.

37. The following heads comprise a synopsis of PLIQUES'S paper:

I. *Experimental facts upon which the study of the subject is based.* 1. Normal excitability of the auditory nerve. (Difficulties in the way of making the investigation, depending upon the depth at which the nerve is situated, upon the proximity of the facial nerve, and the relations presented by the central organs. The continued current is the only one that is applicable, and the best procedure is that of Erb, the intensity requisite to produce an auditory reaction being from 4 to 6 milliampères). 2. Altered excitability of the nerve, comprising: (*a*) Pathological increase of excitability (in perforations of the drum-membrane and affections of the labryinth); (*b*) qualitative alteration of the excitability (severe affections of the labyrinth); (*c*) paradoxical excitability (*i.e.*, auditory sensation in ear to which the electrode has not been applied—a condition having no diagnostic significance); (*d*) diminished excitability (labyrinthine disease, or, if accompanied by tinnitus, neuritis of the auditory nerve). 3. Diagnostic value of the abnormal reactions. (Increased excitability corresponds to a hyperæmia of the labyrinth and not to an inflammation of the remoter parts, and, in the case of tumor or injury of the brain, is often associated with a neuro-retinitis). 4. Influence of electricity upon the auditory nerve. (The current gradually increases the excitability of the latter, and electric shocks are injurious to

the function of the nerve.) 5. Disappearance in deaf-mutes of the vertigo produced by galvanic stimulation. 6. Effect on subjective noises. (These increase at the beginning of application of the current, and are diminished when the latter is broken.)

II. *Methods of electrization,* comprising: 1. The constant current. (The positive pole, the efficient one; the negative pole injurious. Application of a weak current which is increased slowly and gradually, sudden shocks or reversal of the current not being employed.) 2. The interrupted current. (Useful to mobilize the ossicles; the electrode immersed in salt water which fills the auditory canal. Unpleasant reflex phenomena.) 3. Static electricity, sparks, and electric baths. (Little used; action a superficial one.)

III. *Therapeutic application.* 1. In tinnitus. Weak constant currents without sudden changes. Application of Gellé's metallic brush. Improvement not constant; sometimes condition rendered worse. 2. Otalgiæ. Continuous current combined with cocaine-anæsthesia, useful in neuralgic pain (Massini). 3. Ménière's disease. Weak currents (to be carefully watched) (Politzer). 4. Opacities of the drum-membrane. Very moderate effect. 5. Ankylosis of the chain of ossicles. Sparks employed; electricity especially useful in incomplete ankylosis. 6. Deafness. Electricity not applicable in labyrinthine deafness. Faradization in hysterical deafness. RIPAULT.

38. Antroscopy is the ocular inspection of the antrum of Highmore by means of an endoscope introduced through an opening made in the canine fossa. According to WAGNER, it is useful for discovering the presence of a drainage tube, of a polypus near the hiatus semilunaris, or of bony partition-walls in the antrum; also, for making the differential diagnosis of an angioma, and for assisting in the operation of curetting. TOEPLITZ.

39. AVELLIS's laryngoscopic mirror admits of being taken apart. Each patient is thus enabled to have his own mirror, which he carries in his pocket-book, while the physician carries the handle to the instrument in his instrument-case. The connection between mirror and handle is made by inserting a knob soldered upon the former into a triangular slit in the latter. [Avellis recommends this construction because the ordinary glass laryngoscopic mirror cannot be disinfected as thoroughly as we ought to require; but this is not true of the mirror made by P. Doerffel, in Berlin, which admits of being immersed in boiling

water for upwards of 2 minutes. As this can be done 25 times before the mirror gives out, the cost of each examination is only about 5 pfennings (a little over 1 cent).—REVIEWER.] Avellis's instrument-case contains in very small compass 6 mirrors, 1 shank for the same, 2 handles, 1 nasal speculum (modified from that of Fränkel), 1 tongue spatula, bulb-pointed and fluted laryngeal and nasal sounds, which can also be used for the ear, cotton-holders, knife, squint-hook, 3 ear-specula, 1 vial of cocaine, and 1 reflector with head-band. The whole, complete, costs from 50 to 63 marks, and can be had of Steiner, 58 Allerheiligenstrasse, Frankfort-a.-M. ZARNIKO.

40. KEIMER has devised a handle for a galvano-cautery snare, the novel feature of which consists in the fact that contact is effected by the forward movement of a slide attached to the ring in which the thumb is inserted. Manufactured by Blänsdorf's successors in Frankfort-a.-M. ZARNIKO.

41. MCDONALD'S instrument is based upon those devised by Mackenzie and Jarvis, respectively. The particular advantages claimed for it are, that the wire need not be entirely withdrawn into the barrel, and so is less likely to break. By an ingenious mechanism, too, the growth, after once it has been firmly grasped by the wire loop, can be twisted or torn off if the operator should consider that method preferable to simply permitting the wire to cut its way through. SILK.

42. The tonsillotome described by BOYD differs from Mackenzie's well-known instrument, inasmuch as it is operated by a trigger or pulling action, and consequently the cutting surface is ring-shaped rather than spade- or chisel-shaped. To improve the grasp, the instrument is furnished with a handle which has been modelled to the shape of the closed hand, somewhat after the manner of modern midwifery forceps. SILK.

43. Mr. KELLY (of Glasgow) suggests that in certain cases the use of the tonsillotome is inadvisable, and that in these cases it is better to punch a series of small pieces out of the tonsil, rather than slice off the whole mass. An instrument for this purpose is figured and described. SILK.

44. GLEITSMANN'S conchotome has one cutting blade; the other, of soft metal, being introduced between the septum and middle turbinate. A separate instrument is needed for each side.

TOEPLITZ.

45 RANKIN'S instrument differs from an ordinary scissors in having a serrated cutting edge. It is made by Feick Brothers at Pittsburg, Pa. TOEPLITZ.

46. CHAPPELL'S is a ring-knife attached to a handle by an angular shaft. It is over six inches long, the ring being half an inch long, three-eighths of an inch wide, slightly curved, bevelled, and sharp. It is used for the removal of small enchondromata, small growths, and tissue remaining after other operations on the septum. TOEPLITZ.

47. In GOLDSTEIN'S uvulatome, two claws for grasping, and a ring-knife for cutting the uvula pass through cannulas and end in a thumb-ring and two finger-rings, respectively, the former being pushed forward, the two latter pulled backward.

TOEPLITZ.

EXTERNAL EAR.

48. HAUG. A new and simple plastic method for setting back auricles which stand out too far. *Deutsche med. Wochenschr.*, No. 40, 1894.

49. PERONI and GRADENIGO. Spontaneous gangrene of both auricles, the tip of the nose, and the toes. *Archivio ital. d'otolog.*, etc., p. 235, 1894.

50. FERRERI. On epithelioma of the auricle. *Ibid.*, p. 214, 1894.

51. RANDALL, B. A. Bilateral hæmatoma of the lobule. ARCH. OF OTOL., July, 1894.

52. SPIERS, H. H. Cyst of the auricle. *Cincinnati Lancet-Clinic*, Dec. 8, 1894.

53. HOVELL, M. Exostosis of the external auditory canal. *Br. Med. Journ.*, June 16, 1894.

54. TAYLOR, S. JOHNSON. Exostosis of the external auditory canal. *Ibid.*, Oct. 20, 1894.

55. OSTMANN. Contributions to the question of the relative frequency of exostoses of the bony external auditory canal in different races. (Two plates.) *Monatsschr. f. Ohrenheilk.*, Nos. 8, 9, 10, 1894.

56. KUHN. A case of atresia auris acquisita. *Deutsche med. Wochenschr.*, No. 27, 1894.

57. DUNN, J. A case of otitis externa hæmorrhagica. ARCH. OF OTOL., July, 1894.

58. CORTELYOU, P. R. Inflammation of the external auditory canal following facial erysipelas. *Med. and Surg. Reporter*, Nov. 10, 1894.

48. HAUG's operation consists in making two semilunar incisions behind the ear, one along the line of insertion of the auricle, the other somewhat farther back. The skin comprised between the incisions is removed and the lips of the wound united by sutures, considerable tension being made. If the cartilage is very resistant, it is fractured before the operation. The application of a compressing bandage ensures satisfactory healing.

NOLTENIUS.

49. PERONI and GRADENIGO's case was that of a man 43 years of age, who, though extremely emaciated, suffered neither from syphilis nor tuberculosis. In the space of three months gangrenous ulcerations developed upon both auricles, the tip of the nose, and the middle toes. GRADENIGO.

50. FERRERI's paper constitutes a complete monograph upon the subject of epithelioma of the auricle and contains an account of his own operations and those of Rossi and Gradenigo. Several histological illustrations are appended. GRADENIGO.

51. RANDALL's patient, a young girl, aged fifteen, was first seen on Nov. 28, 1893. At that time, each auricle presented a soft fluctuating tumor of purplish-red color at the posterior attachment of the lobule. The ears had been pierced for ear-rings four weeks before; no trouble had been experienced until a week previous, when, in an epileptic fit, strong traction had been made upon the lobules or on the rings worn in them, as a measure of resuscitation. Incision was made on each side, with little pain, giving exit to dark blood with no sign of pus; and the cavities were found to be partly filled with granulations and to extend to the slightly bared lower end of the auricular cartilage.

G. BACON.

52. SPIERS's case was one of tumor, involving the helix, upper part of antihelix, and the fossa between them. The growth was firm and dense. An aspirator needle, introduced, withdrew about half an ounce of thick reddish-colored fluid. Two drachms of ethereal tincture of iodine were then injected. A perfect cure was obtained two months later. G. BACON.

53. HOVELL in removing an exostosis from the meatus of a

woman, aged twenty-two, first used a small dental drill, and into the hole thus made fixed a screw-headed instrument, and was thus able to break the exostosis from its base. SILK.

54. TAYLOR places on record a case in which he removed a very large exostosis by detaching the auricle posteriorly and tapping the growth with the chisel. The exostosis had sent out an offshoot posteriorly into the meatus, which had completely destroyed the membrane. SILK.

55. OSTMANN went systematically through the craniological material in the anatomical museums of Königsburg, Berlin, and Halle, the private collection of Prof. Schmidt at Leipzig, the collection of the Senkenberg Institute in Frankfurt-a.-M., the Cabinet of Natural History at Darmstadt, and the Anatomical Institute at Breslau. He examined 2633 skulls of all races. Exostoses of the external auditory canal were found 16 times. Of this number, however, all but 3 occurred in the skulls of American races, no less than 6.4 per cent. of crania of this class seeming to be thus affected ; and the Peruvian race alone comprised 12 of the cases. The remaining 3 occurred in skulls of Australian and Pacific island races (1.77 per cent.), and ancient and modern Egyptian skulls ; while in European, Asiatic, and Negro skulls not a single instance was found. It appeared also from Ostmann's examinations that the shape of the lumen of the auditory canal is in a general way dependent upon the shape of the skull, being more circular in dolichocephalic and more or less oval in brachycephalic skulls, and he ascribes the relative frequency of exostoses in the Peruvian race partly to the flattening of the canal due to the shape of the skull and partly to the excessive tendency which this race displays for the formation of osseous growths in general.

56. KUHN reports a case of atresia auris acquisita. A mother, in order to cure an otorrhœa, had put a blister on over the external orifice of the canal, and for years had painted the ear with cantharidal ointment. The auricle had consequently become altogether drawn out of shape and shrunken, and the orifice had been reduced to the size of a pin's head. The first attempt at relieving the deformity, by cutting out the cicatricial mass, failed owing to the great subsequent cicatricial contraction. A second operation, in which portions of skin were transplanted upon the surface of the wound made, had the desired result.

NOLTENIUS.

57. DUNN's patient, a man aged thirty, complained of sudden pain in his left ear, which increased rapidly in severity until, according to the patient, something burst, and a discharge of blood followed. On examination it was seen that the dermal layer of the bony canal and of the drumhead was the seat of a severe inflammation, which had resulted in the formation of numerous small hemorrhages in the skin. In the afternoon of the same day the patient returned, saying that the right ear was beginning to ache just as the left one had. Hemorrhagic vesicles appeared in this ear also. G. BACON.

58. The case reported by CORTELYOU was one of inflammation of the external auditory canal, following an attack of facial erysipelas. The hearing was very much impaired; the canal, filled with a thick discharge, after removal of the same, was found denuded of epithelium. G. BACON.

MIDDLE EAR.

59. WELSFORD, A. G. Rupture of both drum-membranes from coughing. *Brit. Med. Journ.*, July 14, 1894.

60. GRADENIGO and PES. Upon the rational treatment of acute inflammation of the middle ear. *Arch. f. Ohrenheilk.*, vol. xxxviii., p. 43.

61. BLAXALL, F. R. A bacteriological investigation of the suppurative ear discharge occurring as a complication of scarlet fever. *Brit. Med. Journ.*, July 21, 1894.

62. TURINA. Pyæmic complications in a form of acute otitis media of epidemic character. *Archiv. ital. di otol.*, etc., vol. ii., No. 1.

63. HENNEBERT. A case of acute otitis media. *Rev. de laryngol.*, etc., No. 1, 1894.

64. DAVIDSOHN. Upon otitis media diabetica. *Berl. klin. Wochenschr.*, No. 51, 1894.

65. SCHUBERT, PAUL. A contribution to the clinical history of the severe complications of otitis. *Monatsschr. f. Ohrenheilk.*, No. 11, 1894.

66. WINTER and DEANESLEY. A case of cerebellar abscess successfully treated by operation. *Lancet*, Dec. 8, 1894.

67. DRUMMOND, D. Abscess of the cerebellum. *Ibid.*, July 28, 1894.

68. HARRISON. Cerebellar abscess; meningitis; sequestrum upon the inner aspect of the skull. *Ibid.*, Oct. 6, 1894.

69. BROCA. Treatment of encephalic abscesses of auricular origin. *Gaz. hebd. de méd. et de chir.*, No. 38, 1894.

70. KNAPP, H. A case of otitic brain abscess (chronic otorrhœa, optic neuritis, homonymous hemianopsia, opening of mastoid and skull, cerebral hernia); recovery. *Trans. Amer. Otol. Soc.*, vol. vi., part 1., 1894 (and ARCH. OF OTOL., July, 1894).

71. BUCK, A. H. A case of acute inflammation of the middle ear terminating in purulent periphlebitis of the lateral sinus and thrombosis; operation; recovery. *Trans. Amer. Otol. Soc.*, vol. vi., No. 1, 1894.

72. MOOS, S. Three fatal cases of intracranial complications. ARCH. OF OTOL., July, 1894.

73. JACK, F. L. A case of septic thrombosis of the lateral sinus. Nine cases of mastoid operation with complications. A case of osteoma of auditory canal. *Trans. Amer. Otol. Soc.*, vol. vi., part 1, 1894.

74. CROCKETT, E. A. A case of operation upon the lateral sinus with remarks upon eight unoperated cases. *Ibid.*, vol. vi., part 1, 1894.

75. WILSON, F. M. Five deaths following suppurative otitis, with two autopsies. *Ibid.*, vol. vi., part 1, 1894.

76. COE, A. H. A remarkable case of suppurative otitis with hemiplegia. *Med. Sentinel*, Nov., 1894.

77. MOOS, S. A hitherto undescribed course of a disease of the mastoid process. ARCH. OF OTOL., July, 1894.

78. CLARKE, J. J. Acute mastoiditis. *Lancet*, July 14, 1894.

79. THORNER, M. A case of mastoid operation. *Cincinnati Lancet-Clinic*, Dec. 22, 1894.

80. HESSLER. Upon otitic pyæmia. *Arch. f. Ohrenheilk.*, vol. xxxviii., p. 1.

81. SZENES. Upon the therapeutic value of europhene, alumnol, diaphtherin, and antiseptin in otorrhœa. *Ibid.*, vol. xxvii, p. 229.

82. HESSLER. Upon the climatic treatment of chronic otorrhœa. *Münch. med. Wochenschr.*, No. 50, 1894.

83. BAGINSKY. Upon cholesteatoma of the ear. *Berl. klin. Wochenschr.*, Nos. 26 and 27, 1894.

84. REINHARD. Upon the operative treatment of cholesteatoma. *Arch. f. Ohrenheilk.*, vol. xxxvii., p. 31.

85. KRETSCHMANN. A method of performing retro-auricular plastic operation. *Ibid.*, vol. xxxvii., p. 25.

86. HOFMANN, R. Tenotomy of the tensor tympani in chronic otorrhœa. *Ibid.*, vol. xxxvi., p. 271, and vol. xxxvii., p. 1.

87. ZAUFAL. The history and technique of the operation for exposing the cavity of the middle ear. *Ibid.*, vol. xxxvii., p. 33.

88. FERRERI. Influence of caustic treatment in facilitating the elimination of the ossicles. *Arch. ital. di otol.*, 1893, p. 30.

89. BURNETT, C. H. Surgical treatment of chronic otorrhœa. *Jour. Amer. Med. Assoc.*, Oct. 13, 1894.

90. MCDAVITT, T. Operative procedures indicated in the middle ear and mastoid. *Northwestern Lancet*, Nov. 15, 1894.

91. BARCLAY, R. Ears hopelessly diseased from twenty to forty years. *Med. Review*, Dec. 15, 1894.

92. DENCH, E. B. Middle-ear operations as a means of improving the utility of the organs of hearing. *Trans. Amer. Otol. Soc.*, vol. vi., part 1, 1894.

93. BURNETT, C. H. Chronic tympanic vertigo ; its relief by surgical liberation of the stapes. *Trans. Amer. Otol. Soc.*, vol. vi., part 1, 1894.

94. GELLÉ. Disarticulation of the stapes. *Arch. de laryngol.*, Sept., 1894.

95. JACK, F. L. Remarks on stapedectomy. *Trans. Amer. Otol. Soc.*, vol. vi., part 1, 1894.

96. HEFLEBOWER, R. C. The removal of the auditory ossicles for the relief of chronic deafness and other abnormal conditions. *Med. Record*, Dec. 15, 1894.

97. LAUTERBACH, L. J. Massage versus removal of the sound-conducting apparatus in non-suppurating cases of disease of the ear. *Med. and Surg. Reporter*, Oct. 20, 1894.

98. WÜRDEMANN, H. V. Intratympanic massage and vapors in the treatment of chronic aural catarrh. *Jour. of Amer. Med. Assoc.*, Oct. 13, 1894.

99. KUHN. Myxo-sarcoma of the tympanic cavity. *Deutsche med. Wochenschr.*, No. 27, 1894.

100. COZZOLINO. Cystic and telangiectatic papillary fibroma of the tympanic cavity. *Arch. ital. di otol.*, 1894, p. 333.

101. KÖRNER, O. Tuberculosis of the temporal bone. Transmission of the tuberculosis to the base of the temporal lobe. *Monatsschr. f. Ohrenheilk.*, No. 9, 1894.

102. KÖRNER, O. Pediculate exostoses of the spina supra meatum. *Ib.*, No. 11, 1894.

103. HAUG. Contributions to the question of the significance of hyperostoses of the petrous bone. *Arch. f. Ohrenheilk.*, vol. xxxvii., p. 161.

59. In WELSFORD'S patient, a man aged sixty, rupture of both drum-membranes occurred simultaneously as a result of coughing and was followed by deafness, tinnitus, and loss of bone-conduction. SILK.

60. GRADENIGO and PES investigated many cases of otitis media to determine what relation the micro-organisms that act as exciting agents in this disease bear to the course of the latter and how far they are affected by treatment. The latter cannot aim at direct disinfection, but must consist mainly in increasing the resistance of the organism and in securing the self-limitation of the disease. The first thing requisite when suppuration persists is to effect the escape of the pus through the drum-membrane. This must be done under strict antiseptic precautions, and no opportunity for subsequent infection be allowed nor irritation of the parts by the use of the Politzer bag. Following the principles here enunciated, the authors employ the following method. In light cases an abortive treatment (rest, regulation of diet, instillation of a 1 per cent. aqueous solution of carbolic acid) is tried. If the trouble keeps up, a free paracentesis is made without delay. The operation, which is usually performed in the posterior segment of the membrane, is preceded by irrigation with sublimate solution (1.1000); but after the paracentesis no washes or measures calculated to produce irritation of any sort are employed, and the only dressing used is a tampon of iodoform gauze. RUMLER.

61. After a most careful examination made in fourteen cases, BLAXALL concludes: (1) That the Streptococcus pyogenes is the most potent of the organisms in the causation of the otitis media of scarlet fever, though rodlike forms may ascend through the

nasal and other passages even before the perforation of the tympanic membrane. (2) That the Staphylococci albus and aureus are next in importance. (3) That however important may be the part played by the Diplococcus and Bacillus pneumoniæ in the causation of other forms of otitis media, they are not often found in the otitis of scarlet fever. SILK.

62. During the winter of 1892–1893 an epidemic of acute otitis media appeared among the troops stationed at Turin. There were 96 cases, 76 of which were uncomplicated, while 17 were associated with broncho-pneumonic processes, 7 with mastoiditis, 1 with parotitis and orchitis, 1 with measles, and 4 with metastatic abscesses. The secretion contained pneumococci. Prognosis favorable. GRADENIGO.

63. HENNEBERT, in a case of acute otitis media (produced by the passage of mucus from the naso-pharynx during the act of swallowing), used with advantage the rarefying apparatus and the injection of paraffin into the middle ear. The rarefying apparatus is useful in otitis when the exudate is hard to get out, and especially in the chronic forms in which the opening is narrow or badly situated ; furthermore, as a means of ascertaining in cases of old otorrhœa whether the discharge has ceased or not. Injections of paraffin per tubam are useful to prevent inflammatory stenosis of the tube, to ameliorate pain, and to check inflammatory symptoms in the tympanum. They may actually prevent perforation taking place. RIPAULT.

64. In commenting upon a case of diabetic mastoiditis relieved by dietetic measures, DAVIDSOHN thinks that diabetes is not the direct cause of otitis media, but simply favors its development. He also believes that otitis media diabetica starts, not in the mastoid process, but in the middle ear, and that the rapid and extensive destruction of bone in this condition is due to the enhanced virulence of the microbes brought about by the presence of sugar in the organism. He is in favor of operating in diabetic cases, and does not believe that the operation should be too long delayed. RUMLER.

65. SCHUBERT'S first case was that of a workman, forty years of age, in whom two abscesses developed in the temporal lobe as a result of an acute otitis media. One abscess was opened, but the other, which lay close behind it, was not diagnosticated and caused the patient's death. It is a remarkable fact that in this case a paralysis of the abducens, for which no cause could be

found, set in very early. The second case was one of sinus-phlebitis following acute otitis media and caries of the petrous bone (probably tuberculous), which was cured by laying bare the carious foci, and by incising and scraping the sinus. The third case was one of pyæmia without sinus-phlebitis, which began with an acute otitis media, produced endocarditis and inflammation of the sterno-clavicular and shoulder-joints, and recovered without the performance of any major operation. KILLIAN.

66. This paper by WINTER and DEANESLEY is a valuable contribution to our knowledge of the subject of cerebellar abscess. Not only is the case itself reported in detail, but Deanesley gives a most careful summary of the twenty-one cases collected by him from the periodicals and text-books of the last ten years. The patient was a boy, aged sixteen, who had been slightly deaf for about six months, but had had no noticeable discharge from his ear until about a fortnight prior to his admission to hospital. The method of operating was that suggested by Mr. Percy Dean, *i. e.*, a disc of bone was removed from over the lateral sinus which was thus exposed, and by enlarging the opening thus made in either an upward or downward direction, access could be obtained to the temporo-sphenoidal or the cerebellar region as desired. In this case the temporo-sphenoidal lobe bulged freely into the opening, but nevertheless no pus could be obtained on passing a trocar into the cerebral substance; on the other hand, although the cerebellum did not bulge, nor present any signs of inflammation or adhesion, a few drachms of pus escaped from a trocar passed forwards and inwards. The patient made a quick and perfect recovery, and was able to get up in the fifth week.

SILK.

67. DRUMMOND'S case is that of a patient, aged nine, who was sent to the infirmary with right-sided purulent otitis media, paralysis of the right side, and right-sided convulsions. Although there were distinct traces of fetid discharge from the right meatus, and none from the left, the other symptoms were strongly suggestive of a lesion in the left cerebral region, and the temporo-sphenoidal lobe on that side was accordingly explored, but without definite results, and the patient died in the course of a few days. At the autopsy a large abscess was found in the right lobe of the cerebellum. SILK.

68. That intracranial mischief may remain quiescent and unsuspected for a considerable length of time, is well illustrated by

HARRISON'S case. The patient, a young soldier, was admitted into the hospital with an acute attack of otitis media; becoming worse, Harrison operated and succeeded in opening and draining an abscess cavity in the cerebellum. The patient died a day or two after the operation. At the post-mortem there were evident signs of extensive meningitis; the right lateral sinus was occluded by organized lymph, and a piece of necrosed bone, the size of a threepenny piece, and communicating with the mastoid cells, was found on the inner surface of the skull. Although no history of previous attacks of otitis media was obtainable, there can be no doubt that Harrison is justified in concluding that at some antecedent date the patient had had one or more such attacks, but that the resulting mischief had hitherto remained quiescent. SILK.

69. BROCA speaks of the frequency of otitic brain abscesses, the consequent necessity for their proper prophylaxis, the great dangers attending them, and the diagnostic difficulties which they present with regard to their presence and their localization. They are usually found in portions of the temporal lobe corresponding to the site of the middle-ear lesion or in the cerebellum. Surgical interference should always have the mastoid for its starting-point, but should not as a matter of routine include the opening of the cranial cavity. The opening made into the bone and middle-ear should always be free. RIPAULT.

70. KNAPP reports a most interesting case of a child, nine years of age, who had suffered from a chronic discharge from the left ear, and of late with severe headache and dizziness. Hearing in left ear lost; choked disc, well marked, with sharply defined defect of the right half of the visual field in each eye. Brain abscess in the temporo-sphenoidal lobe diagnosed.

Schwartze's modification of Stacke's radical operation was first performed to remove the source of the brain trouble in its whole extent. Skull trephined 3 centimetres behind and 3.5 centimetres above the ear, and much pus evacuated. Rubber drainage tube inserted. In the third week the secretion ceased and the tube was left out. The wound in the mastoid closed, but a large cerebral hernia, containing another abscess which was opened, remained unchanged for about two months. The optic neuritis disappeared, acuteness of sight became normal, but the hemianopsia remained as before. The child made an excellent recovery [and is well at this day, more than a year after the operation.—H. K.].

G. BACON.

71. Buck reports a case of a strong and healthy man, about fifty-four years of age, who had an acute suppurative otitis media following a cold. Symptoms developed which made it necessary to open the antrum, where some softened bone and pus were found. After the operation the pain disappeared at first, but gradually returned. The patient had a chill and there was a noticeable increase in the redness and swelling of the integument covering the lower and posterior part of the mastoid process. The bone in the lower part of the mastoid was chiselled away. It was hyperæmic, but there was no pus. A further operation showed the presence of pus in the immediate wall of the channel for the lateral sinus. Pus escaped from around the sinus. The opening in the bone was enlarged, so that the jugular vein was laid bare from its situation in the sigmoid groove to a point about one inch below the level of the tip of the mastoid process. The styloid process was also exposed. The patient recovered.

Buck concludes his paper by saying that "the persistence of deep-seated pain behind the mastoid process, after the antrum has been opened into and thoroughly drained, is sufficient warrant for making an opening into the sigmoid groove for the lateral sinus; and it is not advisable to wait until the patient has chills, or until the body temperature rises to an appreciable degree, before resorting to operative interference in this direction.".

G. Bacon.

72. Moos's first case was a notable one of otitic thrombosis of the lateral sinus. Death from pyo-septicæmia after perforation of mastoid process. According to Moos, this case was a notable one in many respects: in particular on account of the rapid onset of the fever—occurring eight hours after perforation of mastoid, not having been present before; on account of the disproportion between the comparatively low temperature and the great extension of the secondary affections in lungs and kidneys; on account of the absence of carious portions which might transmit the local affection to intracranial parts; and on account of the rapidly fatal course.

The second case deserves notice because of the coexistence of most of the otitic complications (facial paralysis, thrombo-phlebitis, cerebral abscess, and meningitis).

The third case is important on account of the two cerebral abscesses remaining absolutely latent during life until a week before death, as well as of the fact that one abscess was situated

in the cerebrum of the diseased side, while the other was in the cerebellum of the healthy side. G. BACON.

73. In JACK's case of septic thrombosis of the lateral sinus, the patient was a man, aged thirty-three years. History of otorrhœa for years, with sudden development of severe pain in the right ear; no tenderness nor redness over the mastoid. Two days later he had a chill with a temperature of 105° F. Operation performed, and the bone over the antrum was found very thick, and the antrum and mastoid cells contained foul-smelling fluid and cholesteatomatous masses, all of which was removed. The patient experienced great relief for seven days. On seventh day he had a chill, with temperature 105° F. and pulse 140. The sinus was exposed by operation and considerable pus evacuated. The sinus was slightly thrombosed, but the thrombus was considered to be of such small amount as not to be likely to become septic or extend to the jugular. The patient died pyæmic four days later. The other cases, with the exception of the osteoma, were those of mastoid disease, in most of which the dura mater or lateral sinus was exposed. They all recovered with one exception. G. BACON.

74. CROCKETT's patient, female, aged fifty-four, gave a history of previous suppuration from the right ear at intervals for fifteen years. The membrana tympani was nearly destroyed. When admitted to the infirmary three weeks later, the appearance of the tympanum had not changed; there was no tenderness of the skull or mastoid, no history of chills. The temperature was, however, 102.5° F. On the third day after admission she had a pronounced chill, with a temperature of 105.5° F. A diagnosis was made of thrombosis of the lateral sinus. Crockett performed a Schwartze-Stacke mastoid operation, and found on the inner table of the mastoid, just over the sinus, two small spots of caries. On enlarging them pus escaped. The bone was removed so as to expose the sinus, which was found thrombosed and bloodless on incision. A thrombus (softened) about an inch and a half long was removed. The sinus was evidently plugged by nature with a firm thrombus. The jugular vein was not tied. The patient made an excellent recovery.

The writer gives notes also of eight cases of sinus-thrombosis observed at the N. Y. Eye and Ear Infirmary. G. BACON.

75. WILSON's cases are: I. *Localized lepto-meningitis.* Male, aged twenty-four. Otitis media suppurativa chronica since

childhood. When first seen by Wilson, Aug. 19, 1891, the patient had been confined to bed six days with severe pain in the right ear and side of head, and had had several chills. Temperature 100° F. He was admitted to the hospital on the following day. On Sept. 1st the right antrum was opened (the patient having had one or more chills every day, with well established symptoms of pyæmia) and found eroded in every direction, through the roof of the antrum to the dura mater, and also through the bony wall of the lateral sinus. At this point the operation was abandoned. Patient died Sept. 11th. Autopsy: Lepto-meningitis entirely localized. Meninges soldered together by plastic exudation over roof of antrum and tympanum, also about lateral sinus. Purulent disintegration of a thrombus in the lateral sinus. Considerable erosion of the bone in all directions was found. Infective material also found in lungs, principally the left.

II. *Pyæmia from sinus-thrombosis.* Male aged twenty-eight. Discharge from left ear since childhood. First seen Dec. 20, 1893. Pain in left ear and side of head. Had had chills for a week. Temperature 103° F., pulse 94, respirations 20. Patient died Jan. 2, 1894. No autopsy obtained. Temperature chart shows a typical case of pyæmia. Lungs affected, owing to sinus-thrombosis undoubtedly.

III. *Acute purulent otitis. Death from infective pericarditis.* Patient seen Feb. 29, 1892, a business man, aged forty-five: he had had no previous ear trouble. He had an acute suppurative otitis media. An early paracentesis was performed, followed later by the escape of pus. Subsequently he had localized pain above the auricle, which gradually subsided and for one day entirely disappeared.

It then returned with increased severity, with elevation of temperature to 105½° F., and tenderness appeared in the neck. Cleansing the antrum caused the pain above the auricle to cease and the temperature to fall to 101° F. Four days afterwards death followed from pericarditis, undoubtedly of an infective nature.

IV. *Chronic otorrhœa. Death from basilar meningitis.* Patient, a well nourished man, was seen July 4, 1892. Discharge from right ear for two years, from left ear one and a half years. About five months later, when seen again, he seemed very irritable and angry if restrained. He had chills. Temperature 103° F., pulse

120. He became irrational. Clonic movements of both sides of the face and arms occurred. No redness, tenderness, or swelling over either mastoid. At the autopsy, the base of the cerebrum, the cerebellum, the medulla, and the cord as far as could be seen from above were bathed in pus. The left auditory nerve was a mass of brownish pulp. There was no bony erosion.

V. *Acute otorrhœa. Death from pyæmia.* Patient, male, aged forty-nine. Six weeks before his visit, he had pain in the left ear, followed by discharge. About two weeks later, a swelling appeared under the left ear, which grew to large size, involving the whole left side of neck and mastoid. Abscess opened in the neck and about one pint of greenish fluid was evacuated. The patient had chills and died of pyæmia. No autopsy.

G. BACON.

76. COE'S patient, aged twenty-five, had previously had severe pain in the left ear for a week or ten days, followed by a free discharge, which continued some days ; then chills and high fever, with vomiting and great pain over the left side of the head. An examination showed profuse discharge from the ear with attic suppuration. He improved under treatment, but two weeks later had daily elevation of temperature from one to two degrees, with pain in ear and side of head. The mastoid was opened but no pus was found. The patient's condition improved for a few days but later he had a severe chill with temperature of 105° F. Some ten days later a swelling of the neck along the sterno-cleido-mastoid muscle was very marked, the patient during this time having chills and a temperature as high as 105.5° F. About five days later pus was found in the swelling on the neck. About two ounces of thick, greenish-yellow pus were evacuated, having been contained between the inner border of the sterno-cleido-mastoid muscle and its sheath, and directly over the jugular vein. The patient improved at once until about ten days later, when he had difficulty in moving the right leg. Intense headache confined to the left temporal and frontal regions followed. The temperature was normal, pulse 60 to 70. The paralysis of the leg then became decided and gradually involved the right arm and hand. There were also hesitancy in speech and a loss of memory as to words. Paralysis of facial on right side supervened. An operation for cerebral abscess was performed, the point selected being one and a half inches above and behind the external meatus. The brain was examined in all directions for some two or two and a half

inches but without result. About the twelfth day following the operation, the patient's general condition began to improve and he was soon able to leave the hospital. A slight amount of facial paralysis remained. The patient returned two months later, with intense pain in the head, followed by coma, with unequal dilatation of the pupils, and finally died with symptoms of brain compression.

Autopsy.—Dura normal except over the motor area on the left side, where it was closely adherent; it was greatly thickened and there was considerable inflammatory deposit of a fibrous nature on the cortex. An abscess was found occupying the lower and central portion of the frontal lobe of the left hemisphere. It consisted of two distant sacs, the larger, the size of a hen's egg, having walls of considerable thickness. The cerebral tissues were softened even for some distance from the sac and broke down readily. G. BACON.

77. MOOS reports the case of a robust man, who suffered from scarlatinal otitis in each ear since childhood. The discharge persisted on both sides up to Feb., 1892, when he had an attack of influenza. On his recovery, a fresh discharge appeared in the right ear, but without any pain, and leading rapidly to a tumefaction over the mastoid process, at times larger, then again decreasing spontaneously in size. At one time it disappeared entirely. When examined May 31st, large central perforation found in left *Mt.* Right ear: profuse suppuration, small perforation, *Mt.* congested, mastoid swollen but not painful to the touch. Pressure over the mastoid caused increased otorrhœa. Repeated paracentesis and other treatment proving ineffectual, an operation was performed and the usual incision made over the mastoid, but this was followed by such excessive hemorrhage that tamponning had to be resorted to. No pus being found at a depth of 1.8 *mm* in the bone, operation was discontinued. Up to June 8th, four days after the operation, there was no secretion; but during that evening "abundant discharge from the meatus." The discharge ceased, only to reappear at times though in daily diminishing amount, till June 17th. July 2d: no swelling over the mastoid, no trace of aural suppuration. A painless course characterized this case. The pus enlargement lay at the lowermost end of the apophysis, and a little to the middle line, but the greater part of the apophysis was free from swelling. The mastoid cells contained no pus, and the antrum was probably obliterated. The

reappearance of profuse discharge after several days of quiescence was evidently due to the regurgitation of the pus from the abscess through the squamo-mastoid fissure. Then follow remarks on the squamo-mastoid fissure. G. BACON.

78. CLARKE makes some observations on acute mastoiditis and the importance of opening the mastoid antrum in these cases. In selecting a point for operation Mr. Clarke chooses the small depression behind and above the ridge of bone known as the supra-meatal spine as being very constant in both adults and children. SILK.

79. THORNER gave the history of a case of mastoid disease in a boy aged ten years, and showed the patient before the Cincinnati Academy of Medicine, for two reasons : first, on account of the case being a good type of final results to be obtained by the modern mastoid operation ; and secondly, because the time that elapsed between the operation and the complete healing of the wound was unusually short, five weeks and five days.

G. BACON.

80. HESSLER examines the criteria by which Körner differentiates otitic pyæmia with sinus-phlebitis from the form without sinus-phlebitis. The latter, according to Körner, originates from the absorption of pus into the circulation from the primary focus in the ear or temporal bone, when the source of the pus is found in the veins of the bone (osteo-phlebitis) and there is no extensive destruction of bone itself. It is more frequent in acute than chronic aural disease. According to Körner, while in sinus-phlebitis metastases in the lungs are frequent and in other organs rare, in the pyæmia of osteo-phlebitis metastases of any kind are infrequent, and metastases in the lungs almost unknown. Hessler, by examination of literature, confirmed this view of the almost constant presence of metastases in the lungs in sinus-phlebitis. He does not believe with Körner that in osteo-phlebitis the infective material is absorbed directly into the blood, but thinks that it gets first into one of the cerebral sinuses. Hence he thinks that, in addition to securing a free exit for the pus from the middle ear and the mastoid, we must also endeavor to avert the development of thrombosis and phlebitis in the sinus, which are always likely to take place. Hence if the pyæmic symptoms and the metastases do not abate after opening the mastoid and exposing the wall of the sinus, the jugular vein must be ligated. Nine histories of otitic pyæmia are appended ; 6 of these were cured.

In 2 of the 3 fatal cases an autopsy was made and in both the evidences of pyæmia due to sinus-phlebitis were found.

RUMLER.

81. SZENES used europhene, alumnol, diaphtherin, and antiseptin (in powdered form) in 86 cases of suppuration in the external canal and middle ear without success RUMLER.

82. HESSLER calls attention to the effect of climate and hygiene upon middle-ear catarrh and suppuration, adducing as an example the differences displayed by country-children and city-children in their liability to these diseases. He emphasizes the importance of pure air in the treatment of these conditions, and points out the proper hygienic precautions that should be taken, particularly in schools. MÜLLER.

83. BAGINSKY believes with Virchow that cholesteatomata are necessarily heteroplastic growths, and with Kuhn that they originate in the course of a chronic suppuration. RUMLER.

84. REINHARD treats cholesteatomata by making a permanent retro-auricular opening, so as to obviate the danger of decomposition taking place in the membranes that are formed. He operates by chiselling into the antrum in the ordinary way, then detaches the membranous canal in its upper and lower parts by means of a raspatory, cuts it across close to the drum-membrane, and draws it out of its bony envelope. The membranous canal thus detached is split in a direction parallel to its long axis and the flaps are attached above and below. The external canal, tympanum, aditus, attic, antrum, and mastoid are transformed into a single cavity, which is kept permanently open both in front and behind. In order to effect this, Reinhard forms a flap from the posterior surface of the concha whenever he finds that cholesteatoma is present. RUMLER.

85. KRETSCHMANN'S paper describes his modification of Stacke's operation as he demonstrated it before the German Otological Society in 1893. It contains four illustrations necessary for the understanding of the technique of the procedure.

RUMLER.

86. HOFMANN, a pupil of Kessel's, gives the subsequent course of the cases formerly reported by Müller (*Arch. f. Ohrenheilk.*, vol. xxxii.), and adds 9 new cases, in all of which tenotomy of the tensor tympani was performed for perforations of the drum-membrane. Of the 30 cases operated upon, it was possible to determine the result in 22. In 3 cases, subjective symptoms (including in

1 case a tinnitus which had lasted for years) had disappeared after the operation. The hearing was improved in 15 %, remained the same in 45 %, and in 40 % was lessened. In 3 of the last-named cases the deterioration was attributable to nasal disease. In 8 cases the discharge was arrested by the operation; in 12, relapses occurred, attributable mainly to nasal complications.

RUMLER.

87. ZAUFAL claims to have been the first to carry out in actual practice the principles laid down by Küster for operating upon the middle ear, and which are, that as free an opening as possible should be made in the bone, that everything diseased should be removed, and that the source of suppuration should be so exposed that the pus will have no obstacle to its outflow. He therefore thinks that the operation, being a typical one, should be called after his own name. As early as April, 1890, he had reported 12 cases operated upon in this way. He operates by extirpating the membranous covering of the upper and back part of the osseous portion of the auditory canal, and then exposes the antrum by chiselling into the mastoid and removing the whole posterior wall of the bony canal. He then removes through the antrum the pars epitympanica and performs exenteration of the tympanic cavity. The instrument used is Luer's bone forceps. He lays great stress upon the necessity of removing everything that is diseased, especially in operating for cholesteatoma, and for this purpose the Paquelin cautery is used after the cavity has been scraped out. A permanent opening behind the ear is not made. RUMLER.

88. FERRERI recommends the employment of a 3 per cent. solution of nitrate of silver before attempting to remove the carious ossicles in otorrhœa. In many cases, he says, the discharge is arrested by this means, and the carious ossicles are spontaneously eliminated. Two case histories are given.

GRADENIGO.

89. BURNETT advises removal of all carious ossicles except the stapes in cases of chronic suppurative otitis media, especially in attic cases; also the removal of all diseased membrane and polypi, so as to allow free drainage. He does not believe in curetting the attic on account of the danger of inducing facial paralysis. G. BACON.

90. MCDAVITT reports 7 cases, of which 3 were cases of acute suppurative otitis media with implication of the mastoid

cells, requiring the usual mastoid operation; 1 case of chronic suppurative otitis media, in which the mastoid was opened and a cure finally established; the remaining 3 cases were old suppurative cases, requiring either removal of all granulations or excision of the drumhead and ossicles. The writer believes that, "if after a thorough cleaning out of the middle ear and the scraping of diseased tissue from the attic the discharge still continues, it may be advisable to open the mastoid for drainage."

G. BACON.

91. BARCLAY reports cases of chronic purulent otitis media where the discharge ceased and disagreeable symptoms disappeared after treatment consisting in the removal of polypi, and excision of the drumhead and ossicles. G. BACON.

92. DENCH reports a number of cases in which operative measures were undertaken, some performed under general anæsthesia and some under cocaine. From his statistics he concludes "that the greatest improvement has followed those operations performed under cocaine-anæsthesia, and where the design has been to secure a permanent opening into the tympanum. This seems to be the most rational procedure in all cases, even where the membrana tympani is intact, and since it can be done without general anæsthesia, we are certainly warranted in recommending at least an exploratory tympanotomy in all cases where the hearing has failed to improve under less radical measures. In no given case can we state the amount of improvement which we should expect, and it is always our duty to inform the patient of the experimental character of the measure." With regard to cases operated on primarily for the relief of discharge, only a few have been included in this paper. In fifty of these cases, operated upon, however, the function of hearing has been impaired in but one. G. BACON.

93. BURNETT gives the name of chronic tympanic vertigo to those cases of chronic catarrh of the middle ear where vertigo of a chronic nature is added to the tinnitus and deafness already present. He considers that the best means of relieving this troublesome symptom is accomplished by removing the incus, and thus relieving the pressure upon the stapes, and he reports a series of cases in support of this theory. G. BACON.

94. According to GELLÉ the stapes after inflammation of the middle ear is often inclosed in hypertrophies of the mucous membrane, and may then be liberated by operation. In other cases

the drum-membrane, owing to the presence of old fungosities, retracts and carries the stapes with it. In otitis sicca, again, the stapes is imbedded and most firmly fixed, and then mobilization or extraction (according to Kessel's method) is advisable. When the round window is obliterated, the stapes immovable, and the oval window inaccessible, the hearing is abolished. When the stapes becomes once more movable, the hearing returns, the capacity for appreciating sounds by bone-conduction is restored, and the tinnitus disappears. A renewed infection (*e. g.* from grippe) abrogates the hearing completely. Multiple deep incisions down to the bone are required. Chromic acid may also exert a favorable effect in ostitis and periostitis of the inner wall.

RIPAULT.

95. As a result of his experience for the last two years, JACK concludes: (1) that the best results in hearing have been obtained in cases of early removal of the bone, and this operation is not advisable in cases of otitis media insidiosa (sclerosis); (2) that cases of chronic aural vertigo have been permanently relieved by liberation of the stapes or by spontaneous expulsion of the bone; (3) that in cases of non-suppurative disease of the middle ear, as well as the class of cases which are the result of a chronic suppurative process, surgical mobilization should first be tried before an attempt is made to remove the stapes; (4) that most operations for mobilizing the stapes or freeing the oval window must be looked upon as largely experimental, and that in many cases a fracture of the crura occurs at the time of attempted expulsion, leaving the base plate. G. BACON.

96. The following are the deductions made in HEFLEBOWER'S paper: 1. No bad results attend the excision of the malleus and the incus, but removal of the stapes is not without the most serious danger, both to life and hearing. 2. That the removal of the malleus and incus alone is far preferable to the removal of the stapes. 3. The operation is of extreme service in chronic suppuration in suitable cases, frequently avoiding m stoid and other serious disturbances of an equally serious nature. 4. It should be performed in cases where there is a high perforation or where the membrana flaccida is perforated, and where the ossicles are necrotic. 5. Tinnitus, headaches of ear origin, and vertigo are relieved. 6. In suitable cases it is invaluable for relieving deafness, whether from chronic suppuration or from chronic catarrh and sclerosis. G. BACON.

97. LAUTERBACH prefers systematic pneumo-massage in the treatment of non-suppurative cases, and does not advise or recommend removal of the ossicles except as a *dernier ressort.*

G. BACON

98. WÜRDEMANN advises a combination of massage and the vapor treatment in the majority of cases of aural catarrh : vibratory massage through the catheter and Eustachian tube. A compressed air apparatus is necessary. Compressed air passes through the medicating apparatus (vaporizer), and is conducted to the mouth of the catheter by gum tubing. The air valve is then turned on at required pressure (about 15 to 25 lbs.) and the tubing at the catheter compressed by the thumb and forefinger, producing an interrupted current, thus applying massage to the tube and middle ear. G. BACON.

99. KUHN removed from a one-year-old boy a myxo-sarcoma that sprang from the middle ear and presented externally through the external auditory canal and also through a fistula beneath the tip of the mastoid, which it had reached by burrowing through the posterior wall of the canal. The patient died from a recurrence. Kuhn thinks that the tumor originated in the cushion of connective tissue existing in the wall of the labyrinth and in which are found at birth gelatinous masses consisting of embryonic connective tissue with spindle-shaped and stellate cells imbedded in a structureless jelly-like matrix. NOLTENIUS.

100. The fibroma of the tympanum in COZZOLINO'S case was remarkable on account of its size. GRADENIGO.

101. In KÖRNER'S case of tuberculosis there was destruction of various parts of the temporal bone including the tegmen tympani. At the latter spot the dura was thickened and covered with granulations containing spiculæ of bone. In one place the dura was adherent to the brain, and both it and the latter contained caseous nodules. The upper lobes of the lungs were tuberculous.

KILLIAN.

102. In two cases observed by KÖRNER, a pediculated exostosis, about the size of a hemp-seed, was found near the spina supra meatum. Both patients had previously had discharging fistulæ opening behind the ear, and Körner believes that the exostoses may have been formed at the spot where the pus had originally perforated the periosteum, being produced by the irritation set up in that quarter by the discharge. KILLIAN.

103. HAUG is a pronounced advocate of the view that hyper-

ostosis of the petrous bone constitutes a direct danger for its possessor, and a very unfavorable complication of other morbid conditions. Hyperostosis of the temporal bone is peculiar in this regard, that the parts are not all uniformly affected; the greatest thickening usually affecting the mastoid, and frequently also the auditory canal, while thickening of the petrous portion is less common. The pus and other secretory products formed in these cases break through in the direction of least resistance, *i. e.*, into the cranial cavity. Osteosclerosis develops after otorrhœas which have lasted a long time. From his own investigations Haug believes that it does not occur after acute or chronic processes of a simply catarrhal nature. He draws his conclusions from one case upon which an autopsy was performed, and thirteen cases which underwent operation. Osteosclerosis renders the spontaneous cure of a middle-ear suppuration impossible, enhances greatly the difficulty of operating, and throws many obstacles in the way of making a diagnosis. RUMLER.

INTERNAL EAR AND AUDITORY NERVE.

104. GRADENIGO. Hemorrhage into the cochlea. *Archivio ital. di otolog.*, etc., 1894, p. 512.

105. LUZZATI, A. Contribution to the study of the static sense in healthy subjects and in those affected with aural disease. *Ibid.*, p. 383.

106. CURNOW, J. Auditory vertigo caused by working in compressed air. *Lancet*, Nov. 10, 1894.

107. BARON, B. J. Four cases of labyrinthine disease treated by injections of pilocarpine. *Brit. Med. Journ.*, Dec. 1, 1894.

104. GRADENIGO saw three cases in which the symptoms indicated the existence of hemorrhage confined to the cochlea. In two cases there was a history of injury. In none were there any symptoms of vertigo. GRADENIGO.

105. LUZZATI's experiments were made with an improved form of Stein's apparatus. The affections of the ear in which static disturbances are found are those in which the galvanic reaction of the auditory nerve is readily induced. They indicate a disease of the inner ear or of the auditory nerve.

GRADENIGO.

106. CURNOW's case was that of a man in whom auditory vertigo set in one hour after he had finished his work in the

Blackwall tunnel, where he had been exposed to a pressure of $2\frac{1}{2}$ atmospheres. No evidences of involvement of the middle ear were present. A three weeks' stay in the hospital produced no improvement. SILK.

107. Of four cases of aural vertigo treated by repeated injections of pilocarpine, two were in no wise benefited. In a third some improvement was noticed in the hearing some months after the injections had been stopped, although the immediate effect of the latter was to produce vertigo and vomiting. In the fourth case the hearing was improved and the vertigo lessened, but the tinnitus remained. BARON believes that the treatment is advisable as a last resort in hopeless cases of internal ear disease.

SILK.

NOSE AND NASO-PHARYNX.

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120. CHAPPELL, W. F. Treatment of purulent rhinitis, sycosis, and eczema of the alæ nasi. *Annals of Ophth. and Otol.*, July 1, 1894.

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108. ZWAARDEMAKER, in discussing the diagnosis of nasal stenosis by means of the respiratory spots, warns us not to base too positive conclusions as to the location of the stenosis upon an asymmetry in the spots. He tries to show that the method is applicable for diagnosticating bilateral stenosis, and speaks of the possibility of making out paralyses of the soft palate by means of this method. ZARNIKO.

109. GRADENIGO tests olfaction by Zwaardemaker's method, and believes that this may furnish important data for the diagnosis of the stage of chronic catarrh when the objective examination fails to do so. GRADENIGO.

110. CHAPPELL reports four cases of vasomotor rhinitis occurring in patients with chronic malaria which promptly yielded to quinine. TOEPLITZ.

111. STRAIGHT'S case was that of a man, aged thirty-five, who suffered for two years and a half from attacks of vasomotor rhinitis, which came on suddenly and occurred summer and winter about every two weeks, each attack lasting nearly two days with excessive sneezing and discharge, but without asthma or constitutional symptoms, and without trouble during the intervals. There was no morbid nasal condition. Every kind of treatment, including cauterization with chromic acid, had been without avail. Finally, superficial cauterizations of the lower turbinates with the galvano-cautery led to speedy recovery.

TOEPLITZ.

112. WOLFE lays stress upon the neurotic habit in patients suffering from hay-fever, and claims that, if the treatment is early directed against it, viz., beginning two months before the approach of the disease, the cases are positively cured. He uses Bosworth's belladonna and zinc-phosphide combination for this purpose (pills containing each $\frac{1}{6}$ gr. phosphide of zinc and $\frac{1}{4}$ gr. belladonna). In badly nourished patients, $\frac{1}{40}$ gr. of arsenious acid is added to each dose of the above prescription.

TOEPLITZ.

113. DUNN reports the cases of three adults who were frequently seized with spasmodic coughing spells, vomiting after breakfast, and a constant effort at clearing their throat. Two of

these cases were cured by the removal of a relaxed uvula, treatment of nasal hypertrophy and deviated septum ; the third case by the removal of swollen papillæ circumvallatæ which rubbed against the normal uvula. TOEPLITZ.

114. BLAIR argues against Greville McDonald's views expressed in his treatise on nasal asthma, which tend to refute the reflex theory. Nasal obstruction causes nerve irritation, but exposed "nerve points" may exist without obstruction. The "points" are acted upon by offending substances (idiosyncrasies). The treatment should not only remove the local causes, but also restore the tone of the weakened nerve-centres. Two cases illustrate that recovery can thus be looked for even in affections of long standing. The prognosis is not unfavorable in the latter, unless permanent damage has been done to the nervous system or to the air-passages. TOEPLITZ.

115. DMOCHOWSKI, in 64 autopsies upon persons dying of tuberculosis, found tuberculous disease of the nasal mucous membrane in 21. This involvement was especially frequent in acute miliary tuberculosis (6 out of 9 cases). The lesion in every instance was one of those extensive, destructive ulcerations which one is apt to regard as constituting the primary affection in this disease. The nasal mucous membrane is a place to which infective germs, whether entering during inspiration or thrown out with the sputum, are particularly liable to adhere.

116. CHIARI reports six typical cases of tuberculous tumors of the nasal mucous membrane. Tubercle bacilli were found in four, but all exhibited the typical histological character of tuberculous growths. From these cases and nine others, collected from literature, he gives a clear and comprehensive account of the clinical picture of this disease. He regards it as distinct from lupus. ZARNIKO.

117. CLARK reports a mixed sarcoma, probably melanotic, occurring in a woman aged seventy-nine, and which, in two years, developed from a small, hard swelling of the left lower turbinated body to an extensive ulcerated, friable growth, involving the septal surface of the other nostril, the pre-maxillary fossa, and the face of the same side. TOEPLITZ.

118. SCHWAGER describes the characters of cavernous angioma of the nasal mucous membrane. This occurs as a circumscribed dusky or bluish-red tumor, which cannot be completely indented by the sound, and subsides but little under cocainization.

It is found only upon the inferior turbinate and the septum. Profuse bleeding is regularly produced when it is removed by snaring. It consists of venous vessels, which increase in number and size from without inward. The superficial vessels have a regular, round or oval lumen, the deeper are irregularly shaped. In places the vessels may be seen to anastomose. Schwager differentiates cavernous angioma from telangiectatic tumors, which are produced by the simple dilatation of pre-existing vessels; yet tumors of this latter class form the preliminary stage in the development of cavernous angioma, and many intermediate forms exist between the two. ZARNIKO.

119. Under the name of turbinal varix WINGRAVE describes that form of hypertrophic rhinitis which is characterized by a permanent distension of the venous sinuses of the inferior turbinal body. He maintains that not only do muscle fibres exist in the walls of the sinuses, but that it is to the morbid changes occurring in these fibres that this particular form of vascular hypertrophy is due. With regard to treatment, Mr. Wingrave recommends removal by means of the ring-knife. The paper is supplied with numerous figures, representing both the macroscopic and microscopic appearances of the diseased structures. SILK.

120. CHAPPELL'S treatment for sycosis and eczema of the introitus narium consists in the application of solutions of nitrate of silver of from two to ten per cent., assisted by the following ointment: Acid. carbol., gr. ij; acid. tannic, gr. iij, mixed with benzoïnol, ℥ ss., and ung. zinc. oxid. ad. ℥ i. The average time of treatment required for the nine appended cases was about five days. TOEPLITZ.

121. According to CHAPPELL, apart from nasal obstructions and pharyngeal hypertrophies, naso-pharyngeal catarrh depends on hereditary constitutional dyscrasias, such as the syphilitic, tuberculous, and rheumatic, and on acquired dyscrasias, derived from the digestive tract. The syphilitic cases are treated with the liquor arsenici et hydrargyri iodidi, the tubercular with cod-liver oil, the rheumatic with ointments of carbolic acid and camphor externally, and belladonna, quinine, and camphor internally. In the digestive cases the stomach should be treated. Chappell reduces hypertrophic gland tissue with crystals of carbolic acid and iodine āā 120 grains, dissolved in two drachms of alcohol. The dropping of mucus is stopped by powder containing nitrate of silver. TOEPLITZ.

122. DELAVAN argues against the growing evil of the cocaine habit, formed in physicians and patients, by prescriptions and patent medicines, and he urges that the careless use of the drug be discontinued. TOEPLITZ.

123. DALY says that galvano-cautery should be used for the removal of real nasal hypertrophies and for restoration of nasal breathing, but not for the cure of conditions too remote from the nose. In order to obviate its dangers, particularly to the ear and even to life, it should not be employed needlessly, and only by the expert and cautious rhinologist. TOEPLITZ.

125. GOMPERZ records a case, so far unique, of a fatty tumor, the size of a cherry, starting from the point of insertion of the triangular cartilage into the nasal bone. KILLIAN.

126. GOLDSTEIN, after giving an exhaustive synopsis of the details contained in literature regarding the histology, classification, and statistics of nasal polypi, agrees with Hopmann in the opinion that these growths are not very infrequent under the age of ten. In the Königsberg clinic, five such cases occurred out of a total of seventy-five cases observed. ZIMMERMANN.

127. Electrolysis, according to HESS, is a suitable means of removing septal spurs and deflections in cases where the obstruction is not very great, and where (as in phthisical cases) the reaction after a more violent radical operation might be prejudicial. It may most advantageously be employed in the case of small spurs and anterior thickenings of the septum. Hess prefers the bipolar method, using a current strength of ten to fifteen milliampères,and increasing and diminishing its strength very slowly. The sensations of the patient may replace the galvanometer as a measure for the strength to be employed. The sittings last from three to ten minutes, and the intervals between them should be eight to ten days. The reaction is slight, bleeding infrequent, and no after-treatment is necessary. Hess states that in Falkenstein marked reaction after the galvanocautery is rare, a result doubtless attributable to the pure air in which the patients there live and their comparative immunity from the danger of infection. MÜLLER.

128. ZIEM recommends a nasal saw worked by a rotation apparatus, for operating upon a deviated septum. KILLIAN.

129. ANTON has been able to collect thirteen cases of occlusion of the posterior choanæ in addition to the twenty-five cases published by Schwendt. Anton's case was that of a man, twenty-one years of age, who for nine years had noticed that he could

not blow through the right side of the nose. No trouble except some dyspnœa and complete absence of smell in the affected side. The bony plate was perforated by means of a dental engine, and three months later, on opening, six to seven *mm* in diameter still remained. The sense of smell was not restored. RUMLER.

130. HOPMANN believes that ozæna is a disease *sui generis* and holds to Zaufal's view that abnormal width of the lumen of the nose is its prime determining cause. This abnormality again he regards as due to an arrest of development originating during fetal life and perhaps dependent upon fetal rhachitis. He also ascribes an important part in the development of ozæna to inflammatory processes. In order to substantiate these views, he alleges the result of measurements made in the nose and naso-pharynx. Denoting the total length from the tip of the nose to the posterior wall of the naso-pharynx by 100, he found that the ratio between the antero-posterior length of the nasal cavity and antero-posterior diameter of the naso-pharynx was in 40 cases of ozæna as 71.29; in 27 with rhinitis sicca, as 77.23; and in 61 patients with other nasal affections or with normal nasal passages, also as 77.23. "In simple ozæna, therefore, the length of the septum from before backwards is generally considerably less than normal, and conversely the depth of the naso-pharynx is appreciably above the normal." ZARNIKO.

131. Following is a synopsis of TISSIER'S paper on atrophic rhinitis. *Etiology:* The disease may be localized (especially upon the lower turbinate or the septum); then usually due to compression (tumors, spurs),or to inflammation with vascular changes. Or it may be generalized, in which case its distribution is not generally uniform. This variety occurs in old people, or as a result of ozæna which has run its course, or in syphilis. *Pathological phenomena:* Cirrhosis with pigment changes (xanthosis, general or localized, due to altered blood-pigment and resulting from previous hemorrhages); ultimately pallor and thinning of the mucous membrane. *Symptoms:* Appearance like that of a serous membrane; resistance to the sound; absence of vascularity. In the localized form, subjective symptoms but slight; in the generalized form, much annoyance from numerous adherent crusts unassociated with lesion of the mucous membrane. Constant concomitants are retropharyngitis sicca and chronic laryngitis; aural affections and nervous disturbances frequent. Fetor need never be present, if the proper treatment is used.

Treatment: A cure impossible in the generalized form; as mitigating treatment, salt baths, insufflations, and balsam of Peru may be used.

The author also speaks of *atrophy of the anterior portion of the septum.* Its stages are: (*a*) that of hyperplasia, associated with frequent epistaxis and the formation of crusts upon the septum at the anterior orifice of the nose; (*b*) that of retrogression, marked by pallor and thinning of the mucous membrane; (*c*) that of fibrous transformation, marked by atrophy and great anæmia of the mucous membrane, disappearance of the glands, and sometimes perforation of the septum. Treatment consists in the use of salves and cauterization to prevent epistaxis.

RIPAULT.

132. GIBB advises, after thorough cleansing of the nasal cavities by antiseptic detergent solutions, cotton wiper, and peroxide of hydrogen, and of the naso-pharynx with the post-nasal syringe or atomizer, the use of zinc stearate incorporated with europhene 25 per cent., on account of the tenacity with which it adheres to the mucous membrane. He claims, in a total of 32 well observed cases, to have thus caused complete disappearance of odor and crusts in 27, and a promise of restoration of normal structure in 2 of these cases, whilst in the remaining 5 the result was doubtful, though the improvement was quite marked. TOEPLITZ.

133. MORF'S general conclusions are: That chronic atrophic catarrh attacks chiefly young people, and women are more often affected than men; the secretion in 90 % of the cases is fetid, and a unilateral disease is extremely rare. Disease of the middle and inner ear is a frequent complication; pathological alterations in the drumhead without deafness are rare. The middle-ear disease is generally the consequence of disturbed tubal ventilation.

G. BACON.

134. STEPANOW describes with extreme precision and thoroughness the course and the pathological changes found in a case of scleroma. Special regard is paid to the changes found in the nasal mucous membrane in the earliest stages of the disease. It is stated that in the later, or fibrous stage, the determination of the presence of bacteria, and hence the establishment of the diagnosis by the microscope, may be very difficult. KILLIAN.

135. GERBER believes that microbes constitute the regular and essential constituent of nasal calculi, and that, moreover, the most various forms of microbes may be present in these concretions.

KILLIAN.

136. BURGER gives a very precise and exhaustive account of empyema of the maxillary antrum. While laying stress upon the unilateral character and periodicity of the suppuration as a means of diagnosis, he thinks that the latter must, in the main, be made from a careful examination of the nose. In regard to the latter, he has not been able to confirm the existence of the laterally disposed tumefaction of the mucous membrane described by Kaufmann, but finds the chief diagnostic point to consist in the fact that pus is present only in the region of the ostium maxillare, or, in certain cases, only when the patient assumes the attitude described by Fränkel. The diagnosis is sometimes corroborated by the discovery of secondary polypoid or granulation growths, or of a concomitant dry catarrh. Transillumination forms an essential aid to diagnosis, especially from the subjective luminous sensations that it affords. In doubtful cases an exploratory puncture should be made. The paper closes with a brief and very clear summary of the points establishing the differential diagnosis. ZIMMERMANN.

137. According to BRESGEN'S experience, suppuration rarely springs from the general surface of the nasal mucous membrane but usually from some localized spot of disease. He distinguishes two varieties of nasal suppuration. One is produced by contact with gonorrhœal pus (this mainly in the new-born from infection during birth, but also occurring in adults) or other purulent matter, and also occurs in the second period of acute coryza. The other variety, in which there is marked implication of the accessory cavities, forms one of the symptoms of some acute infectious disease, and particularly of measles, scarlet fever, influenza, and diphtheria. A third but comparatively small group is constituted by the suppurative diseases of the maxilliary antrum due to dental caries. Bresgen describes briefly the symptoms of suppuration in the nose and goes exhaustively into the diagnosis. He shows how important it is to employ ocular inspection when cleansing the parts, as it is only in this way that it can be ascertained whether a diffuse or circumscribed suppuration is present, and where the latter is situated In order to determine this point Bresgen makes use of the different positions of the head, and, in the case of the maxillary and frontal sinuses, of transillumination. He also employs exploratory puncture or incision and the sound, the latter especially in diseases of the ethmoidal and sphenoidal cells, a portion of the middle turbinate being removed if

necessary; for localized suppuration originating in the upper region of the nose may arise from simple swelling of the deeper portions of the mucous membrane without there being any implication of the sinuses. In his experience the starting-point of ozæna is generally some circumscribed local affection, and in this regard he considers affections of the accessory sinuses as much more important than diseases of the bone which he finds much less often than does Grunow. Bresgen's treatment consists mainly in a very free operative exposure of the diseased area, and in the case of the accessory cavities the introduction of hexethyl-violet. MÜLLER.

138. KRECKE describes a case of empyema of the frontal sinus of which the main features were suppuration lasting fifty years, rupture externally a year and a half previous to examination, with the formation of a fistula, and exophthalmus. A free opening was made, when the cavity was found dilated to the size of a hen's egg, its mucous layer being transformed into a connective-tissue membrane nearly or quite 4 *mm* thick. Death occurred on the fourteenth day from meningitis due to an abscess of the brain which had given no symptoms. Krecke thinks that when the mucous membrane of the frontal sinus is altered, as in this case, treatment through the nose is impossible, and a free opening should be made from the outside. That is, empyema of the frontal sinus (and of the maxillary antrum too) should be treated like empyema of other cavities with rigid walls, *e. g.*, like pleural empyema or the suppuration of osteomyelitis, in which one wall of the cavity is completely removed so that the cavity can be obliterated. He operates by making an incision along the supra-orbital margin as far as its outer third, stripping up the periosteum above and below, and removing the whole anterior and, if necessary, a portion also of the inferior wall. The mucous membrane is scraped off with a sharp spoon. He does not think it necessary to dilate the passage into the nose. He packs with gauze, renews the dressing after five or six days, and after that every fourteen days. Duration of treatment two to three months. Disfigurement very slight. Krecke believes that a free opening made in this way is a perfectly certain and by no means serious curative procedure. MÜLLER.

139. WINCKLER'S paper is a criticism of Schäffer's method of getting into the frontal sinus by making an opening to the median side of the middle turbinate and by sounding. Winckler exam-

ined the anatomical relations in 33 cadavers. In rather more than half of these it was possible to make an opening in the way indicated by Schäffer, but in only one sixth of the male patients and in less than one fourth of the females could a sound be introduced from the nose into the sinus. Winckler further finds that no conclusions can be drawn from the external configuration of the head as to the extent of the sinus or the thickness of its walls; moreover, as Winckler shows, the lower wall of the sinus is frequently a thick, solid plate of bone, and then the trephine is apt, instead of piercing the latter, to perforate the ethmoidal plate and enter the cranial cavity. ZARNIKO.

140. The patient whose case FINK describes had, since he was twelve years of age, suffered from recurrent mucous polypi in the right nasal cavity. At the age of thirty-three the upper jaw began to bulge, and three years later violent pain set in. Upon opening the antrum through the alveolar process, Fink found soft solid masses filling the cavity. Displacement outward of the zygomatic process and swelling of the glands in the neck soon followed. A radical operation for scooping out the cavity was then performed and carcinomatous masses were removed. A few days later evidences of metastasis in the fifth cevical vertebra developed, and six weeks later the patient died. Fink assumes, quite gratuitously, that in this case there was at the outset a benign tumor of the antrum which subsequently underwent malignant transformation. ZARNIKO.

141. JANSEN ascribes the difficulty of securing a cure in chronic empyema of the accessory cavities to: (1) The obstinacy with which cavities surrounded on all sides by rigid walls resist treatment. (2) To the fact that the empyema frequently affects adjacent cavities and that these produce mutual re-infection. "Serious disease of all the accessory cavities," he says, "is by no means so rare. Thus in seven patients with empyema of the frontal sinus, upon whom I operated last year, I found the ethmoid bone affected in all and the maxillary antrum in six; in two the empyema was bilateral, and in one case I also encountered suppuration of the sphenoidal cells." As another factor (3) he adduces narrowness and unfavorable location of the natural channels of outflow, which, moreover, are frequently blocked up by swellings or granulations. Still another obstacle to the cure (4) is found in the presence of extensive pathological processes, such as very large accumulations of granulation tissue

containing foci of pus encapsuled in them, or extensive carious processes in the bony walls with large defects or sequestra. On account of all these conditions Jansen believes that those who think that they have cured a chronic empyema of one of the accessory cavities by simple irrigation are either mistaken or have not waited long enough to be certain that relapses have not occurred. [In answer to this it may be said that any one who has treated cases of empyema of the accessory cavities either by simple irrigation or by extracting the teeth or perforating the cavity-walls, knows that these diseases often get permanently well, and that too with remarkable celerity. Hence when Jansen recommends a radical operation for all cases, we can only pronounce against his opinion—HARTMANN.] Jansen, on account of the unfavorable prognosis afforded by the methods of treatment hitherto pursued, adopts procedures more radical even than those of the most radical recent operators. His methods are as follows :

A. *In the maxillary antrum.* After detaching the periosteum he removes the whole anterior wall except the portion containing the infra-orbital foramen, which is retained on account of its vessels and nerves. The cavity is scraped out, sequestra, etc. are removed, and a flap of mucous membrane obtained from the alveolar process and from the lips is inserted. The cavity is packed with iodoform gauze and the dressing changed every day or two. After one or two weeks a rubber obturator is inserted, which is attached to an artificial plate or to a sound tooth. This has the object of keeping the wound open and preventing the growth of granulations. The after-treatment lasts often as much as two years, but in great part may be carried on by the patient himself.

B. *In the frontal or ethmoidal sinuses* (which, as above stated, were found to be simultaneously affected in all the author's cases). A curved incision is made running beneath the eyebrow from the external margin of the orbit to the side of the root of the nose at a point below the palpebral fissure ; the periosteum is detached from the lower wall of the frontal sinus, and the floor of the latter removed as far as the root of the nose and the excretory outlet of the sinus. When the sinus is large a strip of its anterior wall, $\frac{1}{4}$–$\frac{1}{2}$ *cm* high, is also removed. The sinus and all its ramifications are cleaned out, and then the same process is gone through with for the ethmoid cells, which are got at from the frontal sinus by removal of their lower wall, which separates them from the orbital and nasal cavities. [Operation already recom-

mended by Grünwald.—ZARNIKO.] Care must be taken not to injure the contents of the spheno-maxillary fossa. It will often be possible and in doubtful cases the attempt should always be made to enter.

C. The *sphenoidal sinuses* from in front and scrape them out. In cases of combined empyema, Jansen first opens the frontal and ethmoidal sinuses, and operates upon the maxillary antrum at a second sitting. In bilateral disease he advises against operating upon both frontal sinuses at the same time.

Remarks on the diagnosis of disease of the accessory sinuses and the detailed histories of seven cases complete this paper.

ZARNIKO.

142. In MACKENZIE'S case, a woman aged thirty-five, who had suffered from otalgia, also from a furuncle of the external auditory meatus and an abscess of the lobe, antral disease was recognized in January, 1889, but was not operated upon before 1892, when, after extraction of the second molar tooth, the floor of the antrum was perforated with a large drill. After the opening had persisted for two years, shreds of false membrane began to come away, varying in length up to that of an index finger. The membranes contained Aspergillus fumigatus. The mode of infection is obscure. TOEPLITZ.

143. BOSWORTH, in discussing ethmoidal diseases, says that they differ anatomically and symptomatically from those of the other accessory sinuses: anatomically, since the ethmoid sinus is composed of a number of cells instead of one cavity; symptomatically, in the presence of intermittent neurotic and ocular symptoms and of so-called aprosexia. A large number of cases of so-called acute rhinitis are really cases of acute ethmoiditis, and other instances of the latter are due to influenza. The acute form may end in resolution or become chronic. In the chronic form an extra-cellular or intra-cellular myxomatous degeneration is set up, or suppuration ensues. The polypi formed in the former way will push the outer wall of the cells against the middle turbinated body and the latter, which may also be in a state of polypoid hypertrophy, against the septum, so as to render the diagnosis of the condition quite feasible. The suppuration may either discharge from the anterior cells through the hiatus semilunaris into the anterior nares below the middle turbinated body; or from the posterior cells and sphenoidal sinus through the superior meatus between septum and middle turbinated body into

the posterior nares ; or, finally, through the os planum into the orbital cavity. The treatment consists for the acute cases in the use of hot saline irrigations by means of the Thudichum douche, applied with the ordinary precautions. For the chronic cases without suppuration, the removal of the hypertrophied middle turbinated body is indicated ; in those with suppuration, opening of the cavity is performed, in addition. For this purpose the small dental burr is preferred to the curette. Among the 97 cases of ethmoidal disease observed by Bosworth during five years, there were 3 carcinomata and 4 sarcomata. The ages varied from the second to the seventh decade of life—the middle decades being those most frequently attacked ; 61 were males, 32 females; 15 were inflammatory, without polypi or suppuration, 9 of which were cured, 3 improved ; 29 showed polypi without suppuration, and of these 12 were cured and 10 improved. Of 22 cases of polypi with suppuration, 9 were cured and 10 improved. Of the 27 purely suppurative cases, 8 were cured and 12 improved, nearly all of these being operated upon by snare or drill. [It would have been of great interest to know in just how many cases the drill was used and with what result.—REVIEWER.]

TOEPLITZ.

144. HAWKES's patient, aged twenty-eight, suffered from headache for twenty years, which dated back to a fall on a curbstone that cut the upper right quadrant of the forehead, about an inch above and parallel with the supra-orbital ridge. The cut had suppurated and was slowly healed. The headaches were practically continuous. The slight depression of bone, not over half an inch in length, was removed by a trephine as a disc of three quarters of an inch in diameter. During the three years that had elapsed since the operation, the patient had had no headache.

TOEPLITZ.

145. According to KING, diseases of the accessory cavities are of dental, nasal, or constitutional origin. The last-mentioned are very rare ; the first-mentioned are more frequent, but are confined to Highmore's antrum. Transillumination, except for diagnosis, of pus in the frontal sinus, cannot as well be depended upon, as abstraction of pus from the cavities by aspirators ; for frontal cases, drilling through the outer skin is preferred. The prognosis is doubtful as to complete recovery, and spontaneous resolution never occurs. The antrum will never become normal ; the other sinuses only after long and radical treatment. King's three fully

reported cases bear out this statement ; the two antrum cases were considerably improved, but not cured after long treatment ; the frontal case was cured three weeks after operation.

TOEPLITZ.

146. WÜRDEMANN'S patient, a girl aged seven, was operated upon for empyema of the antrum of Highmore by incision of the lower lid and by drilling through the alveolar process above a molar tooth. Rapid recovery. TOEPLITZ.

147. DUNN'S patient, a female, aged fifty-three, suffered from double proliferating ethmoiditis, principally of the anterior ethmoidal cells, nasal polypi, hypertrophies of the middle turbinates of both sides, and deflection of the septum. The inner wall of the antrum of the left side was bulging toward the nasal cavity, which was filled with pus. The left cheek was swollen by an elastic tumor which, after destruction of the outer maxillary wall, attached itself to the cheek bone above the gums and extended into the mouth from the first bicuspid backward and upward. It was of the size of a pigeon's egg, and offered little resistance to the bistouri or probe, but contained no pus. An attempt at radical removal failed on account of its extension beyond the antrum and infiltration of the tissues of the neck. The tumor was a carcinoma. The patient died soon after operation. Dunn believes that this case proves the assumption that a benign myxofibroma can be transformed into a carcinoma, which here originated in the walls of the antrum, the mushy, velvety, thickened feel of which suggested this view. TOEPLITZ.

148. FRANK'S and KUNZ'S case was that of a man, aged twenty-eight, with hereditary tuberculous taint. Symptoms : pressure across the forehead, painful swelling over the right frontal sinus with subsequent swelling of the upper lid, the right eye being slightly pushed downward, and fluctuation being present over the lachrymal gland. Through an incision extending from the glabella to the external angular process, a quarter of an inch above the eyebrow, the sinus, by chiselling of the roughened bone, was opened and found to be filled with a yellowish cheesy mass. A carious focus on the posterior bony wall was curetted, thus all but exposing the dura mater. From the right lower angle of the sinus a small channel led from the carious focus on the inner surface of the bone to the fluctuating mass of the upper lid, which contained a drachm of pus. The entire supra-orbital arch was found to be diseased. It was chiselled away and scraped.

The nasal cavity was also curetted through the sinus. Recovery took place on the eighteenth day after the operation. A complete bibliography, comprising 95 cases collected from the *Index Medicus*, is appended. TOËPLITZ.

149. EATON reports a case in which a tumor existed for three years over the right eyebrow of an Italian, aged twenty-six, together with large polypoid hypertrophies of the middle turbinated bodies, particularly of the right, upon the removal of which an abundance of fluid escaped from the nostril. The removal of the frontal-sinus tumor from without, with daily packing of the cavity for four months, resulted in complete recovery. TOEPLITZ.

150. ZIEM, when removing adenoid vegetations by means of cold snare introduced through the nose, controls the operation by introducing the index finger of the other hand into the naso-pharynx. KILLIAN.

151. GUILLAUME calls attention to the influence of heredity in the etiology of adenoids. He thinks that the best method of operating is to crush the growth with the fingers (not simply strip it off with the nail). This should be done with rigid antiseptic precautions. It is inapplicable only when the vegetations are hard or very large. RIPAULT.

152. HESSLER operated upon 100 cases of adenoids with Schütz's pharyngo-tonsillotome and was highly pleased with the result. The instrument can be used readily and without danger even with small children, and, as no injury is inflicted except to the adenoids, hemorrhage is slight. RUMLER.

153. LERMOYEZ reports the case of a child with tuberculous family history in whom removal of adenoids was followed by recurrence and by deterioration of the general condition. In this case there was a latent tuberculosis which was aggravated by the operation. The latter may cause the dissemination of tuberculous germs in the circulation and necessitate the employment of an energetic general treatment. These cases are rare, but their occasional occurrence should make one careful to make a microscopical examination in all cases of recurrence or cases in which there is something suspicious in the previous history. The treatment should be the same as in ordinary cases, but should be especially thorough and be combined with tonic measures. RIPAULT.

154. RIEGNER'S case was that of woman, eighteen years of age, upon whom Gussenbauer's operation was performed for a

cavernous fibroma of the naso-pharynx of one and a half years' standing. It was attached by a broad pedicle to the base of the skull, filled the whole naso-pharynx, had become adherent on the right side to the pharyngeal wall, and sent a process into the right nasal cavity, completely filling it and presenting at its anterior orifice. The after-course was favorable. NOLTENIUS.

155. KAHN, from the consideration of four cases of otalgia occurring in connection with syphilis of the naso-pharynx, in two of which otalgia was the only symptom and the naso-pharynx the only part affected with syphilis, points out how important it is to examine this region in cases of otalgia, and how the latter symptom may lead to the discovery of a serious affection there. In all four cases the otalgia was unilateral ; in two the drum-membrane was normal, in the other cases it was retracted, opaque, and thickened without exhibiting any signs of inflammation. The retraction and thickening were probably not due to the specific disease, as the bone-conduction, which in syphilitic cases disappears early, was here, on the contrary, prolonged. The otalgia therefore was probably in all four cases of reflex origin. MÜLLER.

156. In KRECKE'S case, a patient who had been infected with syphilis thirty years before, and who for a year previous to the examination had suffered from ulcers in the pharynx which had never completely yielded to the influence of potassium iodide, was attacked with great dysphagia and dyspnœa. These symptoms were found to be due to the development of two very hard, smooth, round tumors in the pharynx, the lower of the two being situated above the entrance into the larynx. They shrank, although very slowly, under the influence of potassium iodide. Krecke considers them to have been syphilitic. MÜLLER.

157. BEAN'S patient, a woman, aged twenty-six, had been subject for seven years to attacks of follicular tonsillitis. The last attack left white spots on both tonsils, which extended to the base of the tongue and were particularly marked between the pillars. The curette with subsequent galvano-cautery and general treatment led to recovery. The bibliography is incomplete.

TOEPLITZ.

158. DUNN'S patient, a female, aged twenty four, presented an extreme development of mycosis leptotrichia over the entire lymphatic ring down to the glosso-epiglottic junction, including the pharyngeal tonsil, in which, at first, it appeared but temporarily, later on, however, remained stationary, presenting the same nodular white appearance as in the lingual and faucial

tonsils. Among the many remedies tried in this case, removal by forceps, cold snare, and, above all, applications of saturated solutions of permanganate of potassium cured the affection. According to Dunn's microscopic examinations the cause for the lodgment of the fungi is found in changes of the epithelial layer of the mucous membrane. TOEPLITZ.

159. INGALS reports twelve cases of pharyngomycosis seen during three years, in eight of which a thorough cure was established by the galvano-cautery alone. In seven of these cases the patients had suffered from many previous attacks of "sore throat," which, in eight, had been present from four to eight weeks, but in only one was there distinct evidence of previous follicular tonsillitis. In one case there had existed specific pharyngitis, in three cases dyspepsia, in one case general debility, and half of the cases were in general good health. TOEPLITZ.

160. CROSSFIELD reports two cases of pharyngeal tuberculosis, the first of which was without, the second (farther advanced) with laryngeal and pulmonary lesions, and was also associated with nodules and ulcers within the nasal cavity. Both were treated with curetting and lactic acid, by which the former was cured, the latter greatly relieved. TOEPLITZ.

161. In BUTLER'S case, a male patient aged twenty-six, there was a marked bulging just above the right tonsil, with subacute inflammation. The supposed abscess was incised, and a calculus was found which was so large that it could not be withdrawn with forceps but had to be shelled out with the finger. The stone is the largest tonsillolith on record; it measured 25 *mm* × 22 *mm* × 18 *mm*, and weighed 85 grains. TOEPLITZ.

162. The tonsillolith removed by CAMPANI and ARENA weighed 2.79 *gm.* (43 grains).

163. SCHADLE, in his case of adherent soft palate, severed the attachments with knife and scissors and kept the cavity open by a strip of iodoform gauze split for half its length. The strips were drawn through the nostrils and united with the oral end. The raw surfaces were occasionally brushed with mono-chloracetic acid. TOEPLITZ.

164. In LAMPHEAR'S case, a male patient, aged twenty-four, the affection reported as cyst of the pharyngeal tonsil closely resembles the cases of cyst of the bursa pharyngea, which have been well described by Tornwaldt. TOEPLITZ.

165. In VANSANT'S case, occurring in a miner, aged forty-five,

the tongue was found attached to the surface of the gums and the roof of the mouth by a thick cicatrix which extended across the dorsum opposite the back molar tooth, leaving but a small circular opening near the centre, three eighths of an inch in diameter, which led into a narrow canal downward to the right of the epiglottis. After two preliminary unsuccessful attempts at detaching the adhesions with the knife under cocaine, the scars after preliminary tracheotomy were dissected from the gums, palate, and tongue by means of a semicircular incision under the chin extended to the hard palate. Dissection at the side of the tongue exposed four abscesses, containing one ounce of greenish pus. But the scars re-formed also after this and two subsequent operations, and the patient died from exhaustion.

TOEPLITZ.

166. ROE'S patient, a woman, aged forty-nine, experienced for nine months constriction of the throat, dysphagia, and otalgia, and became emaciated. This was due to a tumor, which projected from the posterior pharyngeal wall, extending vertically from a point opposite the uvula to a point opposite the arytenoid cartilages, and laterally from one posterior pillar to the other. It was ovoid, larger above, and covered with mucous membrane. It was removed under cocaine by an incision, one and a half inches long, in the median line. Enucleation was effected with the aid of a thin, curved elevator, and after careful dissection of the very firm attachment of the tumor, which for its entire length connected it with the underlying prevertebral fibrous tissue. It was found to be a combination of lipoma molle and fibro-lipoma. The cavity that remained healed after three weeks, leaving but a slight scar along the median line. TOEPLITZ.

167. JOHNSON'S patient, a young man aged sixteen, suffered from frequent attacks of acute tonsillitis. Six weeks before the first examination he complained of soreness of throat, dysphagia, thickness of voice, slight dyspnœa, and mouth-breathing. The impregnation with sarcomatous deposits was found to extend over the entire soft palate, faucial pillars, tonsils, and hard palate to within half an inch of the incisor teeth; also backward and downward over a portion of pharyngeal wall, the base of the tongue, the epiglottis, and the upper part of the larynx, but not reaching the true vocal cords. There were cauliflower-like granulations varying in size from a rice kernel to a good-sized pea with partial superficial ulceration, purulent discharge, and

partial development of vessels. The uvula was destroyed, the cervical glands being of about the size of a filbert. The patient was very weak, but not cachectic, and weighed eighty-six pounds. Microscopical examination of the growth revealed a spindle-celled sarcoma. The tumor was treated with hypodermic injections of the toxines of erysipelas and the Bacillus prodigiosus, which were obtained from filtered cultures. Daily injections with erysipelas toxines were commenced with fifteen minims, increasing the dose every day until it had reached sixty minims. The injections made into the arm or leg always caused redness, swelling, and pain, which persisted up to thirty-six hours. The temperature varied from 99° F. to 103° F., with occasional, sometimes severe, chills. The treatment was continued for eight months with but occasional interruptions. A slow, but constant improvement was noticeable, the soreness disappearing first and then the dysphagia; the weight increased to 107 pounds, and the granular masses disappeared. The patient at the last report, a year after the first onset of the disease felt no annoyance. On Oct. 1, 1894, there remained but one or two spots of ulceration and a slight central prominence; otherwise cicatrization and contraction have replaced the tumor and white bands of adhesion between the hard palate and fauces have formed. The stage of acme of development and the final stage of cicatrization are illustrated by two drawings.

TOEPLITZ.

168. STOVER'S patient, male aged thirty-six, exhibited the symptoms of submaxillary abscess of the left side with dysphagia and œdema. The internal administration of calomel and frequent spraying of the throat with tinctura ferri chloridi (1:15) obviated tracheotomy. TOEPLITZ.

169. CASSELBERRY'S patient, a girl aged four months, when convalescent from the pseudo-membranous form of follicular tonsillitis, was seized with suffocation, cyanosis, and stertorous respiration, the voice being unimpaired. On palpation a tumor was found in the median line which pressed upon the larynx and which upon incision failed to yield pus. Tracheotomy led to recovery, effected by spontaneous resolution of the lymphadenitis without suppuration. TOEPLITZ.

Book Notices.

I. **A Review of the Present Status of Otology Based on the Results of my Observations Extending over a Period of Twenty-four Years.** By Dr. F. BEZOLD, Professor of Otology in the University of Munich. Published by J. F. Bergmann, Wiesbaden; ix., and 196 pp. Price 7 mark. Reviewed by Dr. E. BLOCH, of Freiburg. The review translated by Dr. J. A. SPALDING, Portland, Me.

This book, together with the last triennial statistical and clinical report included within its pages, offers us a comprehensive review of Bezold's experience of many years, and contains his latest opinions concerning the most important questions of modern otology. The report for the last three years, from 1890 to 1892, follows in its arrangement those which he has previously published. And in this, the latest one of all, he insists still on the fact, that he relies less and less for a diagnosis upon the apparent condition of the drum-membrane itself, and makes his last appeal in certain frequent forms of ear disease more and more to the functional tests of hearing.

In the grand review of all the reports, the author, in correspondence with the advances in otology, urges the increased value of the later reports in the determination of important questions, and thinks that the last is the most important of all, as it opens points of the greatest weight from a purely scientific point of view.

According to Prof. Bezold, there are three epochs in modern otology: that of the mastoid operation inaugurated by Schwartze; the introduction of an expanded Lister asepsis; and the introduction of functional tests of the organ of hearing to which Lucae gave the first impulse.

And at this point let us say, as Bezold has too modestly forgotten to do for himself, that to him, too, we owe many important

results obtained by his persistence in following out Lucae's suggestions.

I. THE DISEASES OF THE EXTERNAL EAR amounted to about one quarter of all the cases observed, were seen in nine tenths of the cases in adults, and in about two thirds of the patients in one ear only. In *atresia* of the external ear the *annulus tympanicus*, as Joel asserts, is invariably absent, so that any operative experiment is excluded, but even in double atresia the inner ear still maintains some function, so that those so afflicted do not become deaf-mutes.

Another interesting suggestion is the rare *idiosyncrasy to boric acid* powder, revealing itself in the form of a characteristic boric eczema of the meatus.

Furunculosis, in agreement with other authorities, he refers to the external portion of the canal, where the hair glands are most abundant. The author's treatment at present, based on long experience and satisfactory results, is the use of dry pressure plugs of iodoform-cotton pushed in as far as the cartilaginous meatus. This soothes the pain, and relapses are less frequent.

Otitis externa diffusa was seen in but one per cent of the patients, mostly in adults, and generally in one ear. It is possible that many cases of middle-ear suppuration, especially minute perforations of Shrapnell's membrane, the importance of which has only been revealed to us in the last ten years, used to pass for otitis externa. Nevertheless, we can have a fœtid secretion in the external meatus due, as Bezold long since showed, to the bacteria of decomposition.

Otomycosis was never seen except in adults, and the diagnosis was always verified by the microscope.

Bezold was the first German to call attention to a special form of inflammation of the external meatus, a genuine *otitis externa crouposa*, seen mostly in adults, and in but one ear at a time. It is characterized by violent pain, swelling of the retro-maxillary glands, contraction of the meatus, and secretion of a characteristic fibrinous membrane, but not by injury to the hearing.

Exostoses were rare, even in men, mostly in adults, more often bilateral than unilateral, often associated with sclerosis of the middle ear, and very rarely with suppuration.

In discussing the important topic of the *removal of foreign bodies from the meatus* the author says: "Only those who are familiar with the use of the reflecting mirror, and even more so with the

anatomy of the meatus and drumhead, have any right to attempt the instrumental delivery of a foreign body from the auditory meatus."

One third of the isolated affections of the *Mt* were *traumatic ruptures.* At this point we are warned to let well enough alone. Ruptures due to the action of indirect force, especially of compressed air, are rarely followed by suppuration. But if by the use of lotions into a *dry meatus* we bring innocuous pyogenic microbes into contact with the mucosa of the middle ear, these microbes increase upon the latter with great rapidity.

Finally, we observe that Bezold has rarely seen an uncomplicated myringitis, acute or chronic.

II. DISEASES OF THE MIDDLE EAR are seen about three times as often in adults as in children. Tubal affections, on the contrary, with or without exudates into the tympanum, and with or without atrophy of the *Mt* are more frequent in children. In contradistinction to products due to inflammation of any sort, serous exudate with a closed tube, due to hyperæmia ex vacuo, does not contain organisms, as has been proved by Scheibe. The chief therapeutic indication in all diseases of the tube is proper treatment of hyperplasia of the tonsils and adnexa. In the last six years Bezold has removed adenoid vegetations in about a quarter of all of his patients, though the proportion in which they were present was much larger. All closure of the tube is treated with politzerization or with the catheter. Bougies are generally not called for. All tubal diseases are situated almost exclusively at the pharyngeal or tympanal extremities, as Schwartze long since showed. Paracentesis of the *Mt* was performed a few times in such cases, and was never followed by suppuration.

Bezold is of the opinion that *acute or subacute catarrhal otitis media* does not vary essentially from purulent suppurative inflammation. The nature of the secretion, as well as of the micro-organisms, is identical in both, but in the purulent forms the mucosa of the middle ear can no longer resorb the masses of secretion, so that the *Mt* is ruptured and a suppuration of longer or shorter duration is excited. It is only when the *Mt* is perforated that the secretion is decomposed by the entrance of bacilli from the external meatus inward. The ciliated epithelium of the tubal mucosa prevents similar bacteria from entering via the naso-pharyngeal space. Such knowledge is very important, so far as our treatment is concerned, for bougieing the tube and injecting

fluids from the naso-pharyngeal space are contra-indicated, whilst we see only benefit from the use of the catheter aud politzerization.

The *chronic form* of non-suppurative otitis media is rare in children, and generally bilateral. The percentage of such cases varies, in the opinions of otologists, from fifteen to fifty.

It is in this section of otology that we find ourselves in a province in which Bezold has made his name well known. He urges that, too often, both the mirror and the catheter give us no clue to a prognosis, which can only be obtained by careful tests of the hearing. Symptoms of depression on the *Mt* have some value, but when absent, greater weight must be placed on tests with the whispered voice, determination of the lower register for tones by aërial conduction, and the tests which go by the names of their discoverers, Schwabach, Rinne, Galton, Weber, and the final tests for defects in the various tone-registers. Differing from most aurists, our author places but little reliance on Weber's test in this class of patients. Wherever we have pathological alterations in the middle ear, particularly in the sequelæ of suppurations, we get the same results from tests of the hearing power as in the so-called dry catarrh, namely, dislocation upward of the lower limits of tone perception through the air, abnormal prolongation of the diapason vertex, and Rinne abbreviated so as to be no longer + but even —. Any prolongation of bone-conduction beyond the normal limit must abbreviate the positive excess normally shown by the Rinne test.

Bezold cannot understand why, then, in chronic non-suppurative diseases the same complex of symptoms should not indicate the same situation of the disease; in other words, why this complex should not be pathognomonic of diseases of the sound-conducting apparatus. To tell the truth, this diagnostic characteristic is the more certain, since in affections of the nervous portions of the ear we have an entirely different set of functional disturbances.

Simple otitis *with* depressions in the *Mt* was seen in three per cent. of the patients, and *without* them in seven, invariably in adults, and generally bilateral. A third group, dysakusis, which lacks the characteristics of either of the two previous groups, must also be made.

The most interesting group, from a scientific point of view, is the second, *without depressions in the Mt* with its plain diag-

nostic points, its absence in children, its predominance in adults from the age of twenty to fifty, and its great preponderance in women ; in the latter point of view the puerperal period playing a great role. Patients of this class beyond the age of fifty belong rather to the dysakusis group, in which the labyrinth is affected. In the second class heredity plays a role far more important than in all other aural affections, and here too we hear most often of tinnitus and vertigo. The pathology of this class is based on five cases only of post-mortem examinations, in which the author saw ankylosis of the stapes, the rest of the middle-ear being intact. This fact agrees with Politzer's observations, though Bezold's clinical observations are by no means so precise.

From all this we see, according to our author, that it would be better to separate the second group from the catarrhal diseases of the ear, and entitle it "Sclerotic Processes in the Sound-Conducting Apparatus, with a Negative Condition in the *Mt.*" In so doing, we must recall the fact that, so far as we at present know, the pathological process is limited to the plate of the stapes, a district which belongs to the sound-conducting apparatus.

The reviewer would here suggest that, if the author were to try the pressure experiment as a means for diagnosis, he would substitute "Stapes Ankylosis" for the long title mentioned above. Complex cases, capable of easy differentiation by functional tests, are entered on our books as ankylosis with labyrinthine disease, for the labyrinth is often affected as post-mortem examinations show, and as can be diagnosticated during life by contraction of the upper tone-limits.

These observations show, physiologically, that perception of the lower portions of the scale depends upon an intact conducting apparatus.

Bearing these differential points in view, Bezold treats cases of the second group with the pressure probe, rarefaction, and the catheter, excluding all operations which, in his opinion, do not improve the rather poor prognosis. The latter is more favorable with depressions in the *Mt* for then the air douche may exert a favorable influence.

The difference between acutc and chronic suppuration of the middle ear does not lie in the duration of the disease, nor in the size of the perforation, but in the tendency of the perforation to remain patent or to cicatrize. Hence the author regards a phthis-

ical suppuration as chronic from the start. So even in a chronic suppuration, a perforation, even though large, may ultimately close.

Acute inflammation of the middle ear, inclusive of empyæma of the mastoid, is frequent in children, and mostly unilateral. Genuine *acute middle-ear suppuration* Bezold has never seen in adults, in contradistinction to the frequently recurring suppuration in children with tubal difficulties. In those otherwise healthy, the perforation is and remains small. If the suppuration persists, we often see the tympanic mucosa proliferating over the margins of the perforation, a symptom absent in severe constitutional affections. The perforation in acute suppuration is not, as so often taught, in the anterior but in the posterior inferior quadrant. Bezold has never seen rupture of Shrapnell's membrane in acute suppuration of the middle ear.

At this point the author reiterates his dread of Weber's nasal douche, which he applies as seldom as possible, owing to its bad effects in many cases despite the greatest care.

Even after the mastoid becomes affected, the suppuration in the tympanum may cease, the perforation cicatrize, and yet for all that, the morbid process may continue its inroads into the mastoid. The possibility of primary suppuration in the mastoid is rather doubted by the author. Secondary participation is more frequent than has generally been assumed, and if many cases are relieved without an operation on the bone, and without serious complications, this good fortune is only owing to the local relations of the pneumatic cells. The existence of a large number of small cells with a large expanse of mucous membrane, favors the resorption of the secretion, whilst the presence of a few large cells disposes the parts to a prolongation of the suppuration. The pus generally makes its way to the surface of the bone at a spot called by the author the mastoid fossa above the posterior end of the antrum, more rarely at the lower surface of the mastoid.

Under the title of *otitis media purulenta chronica*, Bezold includes all those cases in which the suppuration was present at the time of examination. Those that have ceased are registered separately. This affection occurs in about twenty per cent. of all ear patients, mostly in adults, and more often in one ear alone than in both. Fœtor is found in the neglected chronic cases. Granulations and sclerotic processes are a sort of protection, though at times they may result most unfavorably. The latter

are invariably seen in chronic suppuration of the ears, except in enfeebled and tuberculous patients.

Perforations in Shrapnell's membrane, though first discussed by Moos in 1866, have been more carefully studied only in the last ten years. They are often combined with tubal processes, or with the results of the same, whilst again they may depend on cholesteatoma of the attic and adjacent portions of the ear.

Cholesteatoma was seen in one per cent. of all the patients, and mostly in one ear alone, though this does not represent all of the cases in which stratified epidermis was seen in the middle ear. It is not always the upper margin of the *Mt* and the neighboring bones which are thus destroyed, for occasionally the posterior and rarely the superior portions of the margo tympanicus permit the morbid alterations to make an entrance. The perforation, however, invariably lies at the edge of the *Mt*, so that the epidermis of the meatus can proliferate by propinquity toward the spaces of the middle ear. However much this transformation of epidermis may in its turn be a sort of protective arrangement, in so far as epidermis is a better protection against outside morbid influences than mucosa, it is fatal in cavities in which the exfoliated masses cannot be evacuated, but roll themselves concentrically into cholesteatomatous globules—in other words, in spaces with narrow outlets. Therein lies the increase of these growths, and the further disturbance which they excite when they are moistened and swell, and so exercise increased pressure upon the surrounding bony wall when they become decomposed and give rise to uninterrupted suppuration.

Perforations of Shrapnell's membrane, and cholesteatoma, amongst all the diseases of the ear, cost the most human lives.

Suppurations in phthisical patients have been kept separately since 1881, and Bezold finds that they compose about five per cent. of all the suppurative cases as a whole. They are most frequent in adults, and generally unilateral. Ranked by symptoms, they stand between the acute and the chronic suppurations. The suppuration and the perforation are indeed acute, but other symptoms, as heat, swelling, and pain, are absent. Then we have rapid loss of the *Mt*, by one or more perforations, together with destruction of the ossicular articulations, of the intrinsic muscles, and of the bone.

We must also notice in this category the total absence of any sort of healthy reaction against the devastations on the part of the

tissues affected—such as the mucous swelling, the formation of granulations, sclerosis of the bones, and the formation of epidermis in the mucosa. All of these favorable signs, we repeat, are absent ; and at the most we find a fibrous exudate. Tuberculous exudates cannot be accused as the cause of this helpless condition of the organism, because even when these are actually present, we can see, in the most scrofulous children, caries and necrosis with florid granulations, with subsequent sclerosis of the bones, and epidermization of the mucosa. Here, then, we have rather the reduced condition of marasmic nutritive disturbances, as seen in various infectious diseases, such as diabetes and marasmus of the aged, which offer similar appearances. Occasionally we are brought face to face with congenitally diminished capacity for resistance to disease.

Caries and necrosis which occur in all forms of chronic suppuration are not specially tabulated in Bezold's reports.

The *treatment* of *aural suppuration* is of paramount importance when we consider the proximity of the ear to the brain. In this point of view, Bezold still clings to the dry boric-acid treatment. The only counter-indication is the appearance of a boric-acid eczema as before mentioned. Of course the indications for operations are always followed, and good results obtained. Boric acid is also advised in chronic suppuration with perforation of Shrapnell's membrane and cholesteatoma, a method which many of us have followed to advantage. In operating for cholesteatoma, the author argues for permanent orifices behind the auricle when the cavity in which the disease lies is large or has to be enlarged for removal of the masses. Whilst these cases may recover in a few weeks, those operated upon for caries from tuberculosis, scrofula, rhachitis, or hereditary syphilis, may demand even years for recovery.

Pure *otalgia* was found in more than half of the cases to be due to caries of the teeth.

A special section is given to *scarlatinal otitis suppurativa*, based on over one thousand patients in whom were seen chronic suppuration with persistent perforations or old cicatrices. Our author regrets that treatment rarely begins in these patients till the discharge has long been chronic, because it shows so much neglect by both parents and general practitioner. And this neglect is proved by these facts : that in half of the scarlatinal cases a greater portion of the *Mt* is gone, whilst in acute suppuration only ten

per cent. are so badly affected ; that this membrane is totally destroyed in over thirty per cent. in the chronic and only eight per cent. in the acute ; that the ossicles are lost in twenty per cent. of the chronic and only five per cent. in the acute ; and that deafness occurs in twenty per cent. after chronic scarlatinal suppurations, and only in four per cent. in similar acute suppurative affections of the ears.

What a broad province for prevention of deafness lies here opened before the family physician! He is the one on hand at the outbreak, and it is his chance to treat it in the acute stage. So then from this point of view Bezold urges that more time be given to instruction in diseases of the ear in medical schools. A more forcible argument for the need of such instruction cannot be found than the dry statistics given above.

III.—Diseases of the Inner Ear were observed in about ten per cent. of Bezold's patients, mostly in adults, and more often in both ears than in one only. The diagnosis is invariably based on functional tests of hearing.

Purely nervous disease is known by total and permanent deafness. Here, too, we include deafness with defective speech, or subjective noises without loss of hearing. Five per cent. of these patients *acquired their deafness.* When no visible cause exists, we diagnosticate by exclusion. That is to say, the symptoms indicative of middle-ear disease—prolongation of Schwabach's test, negative Rinne's test, and loss of the lowest tones by aërial conduction—are not only not seen in nervous deafness, but just the opposite. Hence, in diseases of the inner ear, we meet with shortened diapason on the vertex, positive Rinne's test, and preservation of low tones by aërial tympanal conduction. On the contrary, pronounced losses of tones in the scale, particularly in the upper portion, are rare, and mostly seen in deaf-mutes only.

Running like a red thread through the work, we see this persistent advocacy of functional tests, and in this section the theory rises into the dignity of a polemic, which those who are interested can study in the original.

Severe disturbances were seen after *meningitis* in over one hundred patients, and after *mumps* in eleven, most of whom, however, did not come for examination until entering into adult life.

Any exact appreciation of the value of *diaphoretics*—such as pilocarpine and iodide of potassium—in nervous ear diseases is interfered with by occasional spontaneous recoveries—a note-

worthy distinction, by the way, in comparison with sclerotic processes, which rarely retrograde.

Three sarcomata and four carcinomata were observed.

To conclude: the work before us offers much material for thoughtful considerations and many suggestions of practical value in modern otology, and in form and design is worthy of its well known publisher.

II. **Anatomie normale et pathologique des fosses nasales et de leurs annexes pneumatiques.** Par E. ZUCKERKANDL. Traduit sur la 2e édition allemande par L. LICHTWITZ et P. GARNAULT. 2 vols. (text and plates). Paris, 1895.

French readers are to be congratulated upon the appearance of this translation of the second edition of Zuckerkandl's book, which, as the translators justly say, forms the basis of modern rhinology. From random comparisons made with the original, we should say the translation was a satisfactory and adequate representation of the original. The publishers also have done their part well, the get-up of the book being excellent and the print generally clear. The illustrations also are satisfactorily reproduced, and are arranged conveniently for reference, the translators having grouped them all together in a separate volume. The advantages of this plan in a book of this size, used for study and frequent reference, are obvious. A. D.

III. **The Year-Book of Treatment for 1895.** By various authors. Lea Brothers & Co., 1895.

This useful little book, which aims at the difficult task of separating the chaff from the wheat in the field of medical literature, contains some thirteen pages of abstracts of articles upon ear diseases. These comprise mainly reports of the papers presented at the International Medical Congress of 1894 and the meeting of the British Medical Association, with notes upon new remedies, new instruments, and new diagnostic methods. The abstracts are models in their way, being clear and yet sufficiently brief, and giving adequately the gist of the originals from which they are taken. A. D.

IV.—EDWARD BRADFORD DENCH, Ph.B., M.D.: **Diseases of the Ear.** A Text-Book for Practitioners and Students. 615 large-octavo pages on heavy paper. With 8 colored plates and 152 illustrations in the text. New York: D. Appleton & Co., 1894. $5.

This is an interesting and instructive text-book. It does not compare with the fundamental works of Politzer, Schwartze, Gruber, and Urbantschitsch, whose authors by many years of diligent labor have essentially aided in raising modern otology to its present height, but it may be placed on the list of the better English and American treatises.

The anatomy occupies forty-seven pages, and gives a sufficiently clear description of the form and intricate relations of the different parts of the hearing organ, illustrated by numerous good drawings, many from the author's own collection, some very beautiful ones from life and, in the latter parts of the book, in colors by Dr. W. A. Holden.

Though a text-book for practitioners need not aim at the completeness and precision of description found in our standard works on general anatomy, such as Schwalbe and Quain, the author might have pointed out, even more than he has done, the practical importance of the topography of the ear in the way by which, more than thirty years ago, v. Tröltsch placed his text-book at once at the head of all others.

The chapter on the physiology of the ear is very short, twenty-four pages, but in a practical treatise could hardly have been more extended.

The chapters on physical and functional examinations, especially the latter, are very good. It is a help, even to experienced aurists, to find a clear and concise presentation of the many finer hearing tests which have been invented of late, and the very definitions of which are difficult to keep in mind. We mean, besides the well-known tests of Rinne and Weber, those of Gardiner Brown, Schwabach, Bing, Gellé, Eitelberg (not Itelberg), and Gradenigo ; further, the experiments with series of tuning-forks by Lucae, Bezold, Hartmann, Blake, Moos, and others ; then König's rods and Galton's whistle. The comparative loudness of the different consonants in hearing tests is taken from a table of Blake. It would have been an act of justice, and no less graceful to the American author, if the name of the original investigator of this subject, O. Wolf of Frankfort-on-the-Main, had been mentioned.

To this department the author has evidently devoted a good deal of thought and labor.

The practical part of the book gives testimony of considerable personal experience in the whole field of otology.

The descriptions are very clear and enter fully into the minutest details, particularly when operative procedures are concerned. Here the author gives the impression as if he imagined students before him, whose gaze he wants to fix on some important point, and whose hands to guide in a certain direction. This is an excellent feature of the book which comes out best in the intratympanic operations. The performance of a simple paracentesis of the membrana tympani in acute otitis media purulenta may serve as an example. "The incision should lie above and behind the short process of the malleus, be carried upward and inward parallel to the neck of the malleus, until it has pierced the cellular tissue within the tympanic vault and impinges upon the bony wall. The knife is then swept backward to the periphery of the membrane, the deep tissues being divided throughout the whole incision. . . . It is well to extend the section along the postero-superior wall of the ear canal for a quarter of an inch, dividing all the soft parts down to the bone." He calls this incision of the canal down to the bone an internal Wilde's incision, but warns us not to lose time over these superficial operations when there is deeper mastoid involvement.

Of chronic catarrhal otitis media the author distinguishes a hypertrophic and a hyperplastic form. "The changes in the hypertrophic form may consist in an accumulation of fluid, localized or diffused hypertrophic changes, and adhesions." Large incisions readily dispose of fluid within the tympanum, but the collection is exceedingly liable to reaccumulate, especially in individuals beyond fifty years of age. This and the hyperplastic form (sclerosis) are so well known in their symptoms and bad prognosis (progressive deafness) that we shall follow the author only in a few essential points. The prognosis is bad when labyrinthine changes complicate the intratympanic lesion. This may be assumed if the upper tone limit is lowered, as the first turn of the cochlea, the one that perceives the highest notes, lies nearest to the middle ear and suffers first in extensions of middle-ear trouble to the labyrinth. Further help in making this diagnosis is furnished by the tuning-fork. "In a given case where whispered words are but poorly perceived, if the natural relation between air- and bone-conduction is reversed, Rinne becoming negative at the fork c^2 (512 v.) or c^3, we are warranted in assuming that most of the impairment depends on intratympanic changes. If the reversal occurs only at C (64 v.), whereas for c (128 v.) the natural condition

(Rinne +) exists, we may assume that the labyrinth is seriously involved." The author mentions and recommends most of the methods of operative and non-operative treatment used in this obstinate disease. In labyrinth involvement he is very partial to pilocarpine, which he no longer administers by hypodermic injection but by the mouth, beginning with gr. $\frac{1}{8}$ three times daily, increasing the dose gradually until a moderate physiological effect follows each exhibition. In cases where the patient must be away from home the entire day, one dose may be given immediately on rising, another on going to bed. One to one and a half hours after taking the medicine the patient must carefully protect himself from exposure. "No result can be hoped for unless the plan is persisted in for at least two months; if then the slightest improvement is manifested, it should be continued for twice or thrice this period. In syphilitic patients, pilocarpine may be combined with iodide of potassium."

As to the operative treatment in hypertrophic and hyperplastic aural catarrh, the author prefers the removal of the membrana tympani and of the hammer and incus to all other procedures. He thinks that division of the posterior folds, of adhesions of the tendon of the tensor tympani, and of the stapedius may do a certain amount of good, but they all are only partial measures. These operations are not new, and particularly are not new in New York. Twenty-five to thirty years ago they were practised very extensively by the elder Dr. Simrock; during the last ten to fifteen years Dr. S. Sexton practised them with especial enthusiasm and praised the results as highly gratifying. Now our author is their champion. Yet they have not received the full endorsement of the profession. Not much harm has followed them, but the results have been too often disappointing. Without disregarding the objections that can legitimately be raised against them, they rest on one long-known, undeniable fact, viz.: That in sclerosis the impairment of hearing is in many cases considerably improved by a perforation of the drum membrane. Like all the other operators, our author first makes an exploratory myringectomy. A large flap, involving the entire postero-superior segment of the membrana vibrans, is turned downward and forward. Under cocaine anæsthesia the intratympanic structures are inspected and the mobility of the stapes is determined with a fine probe. If this exploration proves favorable and the hearing is improved, the author seeks to establish a permanent opening by removing the whole

drumhead and the malleus and incus, sparing the stapes, but mobilizing it. If a new membrane forms, he removes it; if a third one forms, he removes it likewise. The new membranes are mostly thin, and more or less improvement of hearing is permanent. Labyrinth involvement is a counter-indication to any operation. The author devotes 49 pages to the description of middle-ear operations, and 32 to those involving the ossicular chain. We cannot follow him into all their details, but anybody who wants to practise these operations will receive the fullest information from reading this chapter. The author has operated in this way for sclerosis in 34 cases, in 21 under cocaine, in 13 under ether anæsthesia. In 11 cases he removed the *Mt* and larger ossicles for suppurative processes; in 10 cases he performed stapedectomy. He considers the results satisfactory on the whole, and "though we can state in no case the amount of improvement to be expected, and it is always our duty to inform the patient of the experimental character of the measure, we certainly fail to fulfil our entire duty to the patients if the subject is not presented to them fairly."

Particularly instructive are chapters XXII., on chronic otitis media purulenta, where the author dwells on the importance of curing otorrhœa; chapter XXIII., on the residua of chronic otitis media; XXV., the inflammation of the mastoid process and its treatment; and XXVI., the intracranial complications. In the operative treatment of these diseases the author follows the safe rules of Schwartze. The indications are well drawn and the descriptions of the different procedures are precise, and illustrated by numerous drawings, some even in colors.

Section IV., upon diseases of the perceptive mechanism, contains a great deal of good matter, though there are many omissions. The pathological histology and bacteriology of the labyrinth, to which Moos, Steinbruegge, and others have furnished such valuable contributions, have not caught the eye of the practical author, or if they have they did not set his pen in motion. In the treatment pilocarpine and strychnine are his mainstays, with the addition of the iodides in specific affections. For noises he recommends large doses of hydrobromic acid or its salts.

The diseases of the nose and naso-pharynx, so important in the etiology and treatment of ear disease, are described briefly but very well.

Dench's book can be heartily recommended; the specialist will

value its exhaustive presentation of modern operative ear surgery, whereas for the student a handier, less bulky, less heavy, and correspondingly cheaper treatise, prepared more on an historical basis, with fewer repetitions, and conciser language, might have been preferable. H. K.

V. **Diseases of the Ear.** By MARMADUKE SHIELD, M.B., F.R.C.S. Published by Messrs. Cassell & Co., London.

Mr. Shield is to be congratulated on having produced an extremely clear and practical book; such a work, being founded solely on the author's own experiences, deserves the most careful study by students and practitioners.

He has shown sound judgment in reporting many cases *in extenso*, not because they are rare or anomalous, but because they illustrate and impress important facts.

Debated points and minutiæ are carefully avoided; but a more exact description of the mastoid antrum and its important anatomical relations might have been given with advantage, considering the important part it plays in nearly all the most serious complications of middle-ear suppuration; and further, it must be felt by all who have examined the formation of this cavity from fetal life onwards, that it should be described as forming a definite and regular part of the middle ear.

The statement made on page 14, that "the distance of the antrum from the lateral sinus is from three to six inches," is, of course, a printer's error.

In describing the method of Eustachian catheterization, the operator is directed to stand "on the left of the sitting patient," a proceeding which to most surgeons would seem awkward unless they happen to be left-handed.

In the description of adenoid growths, the following sentences require revision: "Much lymphoid tissue exists in the so-called fossa of Rosenmüller immediately behind the extremity of the lower spongy bones and in the vault of the pharynx." "A mass of lymphoid tissue occupying Rosenmüller's fossa has received the name of the pharyngeal tonsil."

The chapters on aural polypus and the diagnosis and treatment of the cerebral complications of perforative otorrhœa are, as was to be expected from Mr. Shield, extremely valuable.

Turbinated *bones* are constantly referred to, a term which ignores the all-important vascular tissue covering the bones.

The colored illustrations are excellent, and the formulæ given at the end, though few, are of the best.

VI. **The Anatomy of the Nasal Cavity and its Accessory Sinuses.** By Dr.A. Ónodi. Translated by St. Clair-Thomson, M.D., M.R.C.P., F.R.C.S. Published by H. K. Lewis, London.

In the second edition, which has been translated by Dr. St. Clair Thomson, sixteen plates, instead of twelve in the first edition, have been chosen from among fifty or more of sections made by Dr. Ónodi. The translator has considerably enlarged the explanation which faces each plate. The choice of sections made is a wise one, the series giving all that is necessary for obtaining a clear idea of the topography of this complicated region.

The introduction gives the best description we have yet seen of the anatomy of the nose; reference being given at each step to the appropriate plates, which are woodcut reproductions of photographs taken of the sections; this method of depicting the sections has been entirely successful, and takes the place, as much as is possible, of actual dissections.

The difficulty of dissecting the nose under the system ordinarily adopted in dissecting-rooms is so great that some such work as Dr. Ónodi's is urgently needed by those who wish to thoroughly understand nasal anatomy; and we can strongly recommend this book for such a purpose.

Specialists, as well as the ordinary practitioner, will find it extremely useful as a book of reference.

VII.—P. Garnault: **Précis des Maladies de l'Oreille.** A duodecimo volume of 550 pages, with 173 figures in the text. O. Doin, 8 Place de l'Odeon, Paris, 1895. Price 8 francs.

Garnault's *Précis* is a carefully prepared text-book, very handy, very well arranged, with judicious divisions and subdivisions; rendering conspicuous by heavy-face type the subject-matter of each paragraph, such as a student wants for committing to memory, and a practitioner for informing himself readily on questions that may come up in discussion or for reference in obscure cases in his practice. Numerous excellent drawings, mostly taken from the *Anatomie* of Testut, and the French translation of Politzer's text-book, are a great aid to understanding normal and pathological conditions and the management of cases. The section on operative interventions is clear and to the point; insufficient, however, in the most difficult department, the operations for otitic brain diseases.

The author gives a good, short, yet exhaustive description of the methods and usefulness of *massage in aural disease.* Mentioning the external massage of the neck by Gerst, Zaufal, Politzer, Urbantschitsch, and Eitelberg for inflammatory affections (p. 243, etc.), he speaks of the compression and rarefaction of the air according to Hommel and Delstanche; then he describes Urbantschitsch's, Laker's, and his own studies on the massage and vibratory dilatation of the Eustachian tube; and lastly details the *direct vibratory massage of the tympanic membrane and the ossicles.* By an electromotor the "ear vibrator of Garnault" (a piston with a spiral and an inverted conical tip passing through a Siegle speculum) is moved and acts directly on the short process of the malleus, and through it on the ossicles, in a similar way to Lucae's elastic pressure probe. Garnault's apparatus has the advantage over Lucae's probe that its application, controlled by the eye, is painless.

The author is very familiar with German literature, and quotes from it more than from any other, even that of his own country. His book can be highly recommended. H. K.

VIII.—A. Broca and F. Lubet-Barbon: **Les Suppurations de l'Apophyse Mastoïde et leur Traitement.** A monograph of 269 octavo pages, to which the Meynot Prize (1894) has been awarded by the French Academy of Medicine. G. Steinheil, Paris, 1895. Price 6 francs.

This excellent monograph is based on 146 operations on 129 patients of the two authors, who, the one a general surgeon, the other an aurist, have worked hand in hand. They go historically and critically over the whole subject, paying particular attention to the modern advances in this fruitful and important field. Starting from a safe anatomical basis the authors support their conclusions, not infrequently in opposition to the most esteemed authorities, by their own experience. The report of the numerous cases is as interesting as the text. Their use of the incident literature is extensive and appreciative, exemplifying once more the excellent spirit of modern French science, in contradistinction to that of the period of the Second Empire. The style is as simple and clear as it is elegant. For the surgeon that takes an interest in the subject, the monograph under consideration will be attractive in the highest degree. We abstain from giving extracts, but recommend to our friends most heartily to read the book itself from one end to the other. H. K.

MISCELLANEOUS NOTES.

APPOINTMENTS.

WALKER, H. S., F.R.C.S., Lecturer on Ophthalmology and Otology to the Yorkshire College, Leeds.

BUTTS, STANLEY DE, M.D., Honorary Anæsthetist to the Royal Ear Hospital.

MATHESON, J. C., M.B., C.M., House Surgeon to the Royal Ear Hospital.

YEARSLEY, P. MACLEOD, F.R.C.S., Clinical Assistant to the Ear Department, Westminster Hospital.

PEGLER, L. HEMINGTON, M.D., Assistant Registrar to the Central London Throat and Ear Hospital.

HEWLETT, R. T., M.D., Pathologist and Registrar to the Throat Hospital, Golden Square.

LINDSAY, F. W., L.R.C.P., L.R.C.S., Ed., has been re-appointed Honorary Surgeon to the Victoria Eye and Ear Hospital, Hereford.

ERSHINE. J., M.A., M.B., has been appointed Lecturer in Aural Surgery in Glasgow, vice Dr. THOMAS BARR, resigned.

OLIVER, G. H., M.R.C.S., L.R.C.P., L.S.A., has been appointed Assistant Surgeon to the Bradford Eye and Ear Hospital, vice G. H. DODD, resigned.

BRADY, A. J., has been re-elected Aural Surgeon to the Sydney Hospital, Australia.

WILKINSON, W. C., has been re-elected Assistant Aural Surgeon to the Sydney Hospital, Australia.

SOCIETY MEETINGS.

British Medical Association will meet in London on July 31st, August 1st and 2d. The Otological Section will be under the Presidency of Sir. Wm. Dalby, M.B., F.R.C.S. On August 1st, Professor Macewen, of Glasgow, will open a discussion on Cerebral Complications in Relation to Middle-Ear Disease. Various papers will be read and specimens exhibited on the other two days.

Programme of the Laryngological Section :

July 31st—The Etiology of Mucous Polypi of Nose. Introduced by Professor Guye, Amsterdam. Dr. Luc, Paris, Dr. McBride, Edinburgh.

August 1st—The Infectious Nature of Lacunar Tonsillitis. Introduced by Professor B. Fraenkel, Berlin. Dr. J. MacIntyre, Glasgow.

August 2d—The Indications for Early Radical Operations in Malignant Disease of the Larynx. Introduced by Dr. D. Bryson Delavan, New York. Mr. H. T. Butlin, London.

The Section will meet in the North Room of the Examination Hall, Thames Embankment, at 10 o'clock.

The International Congress of Otology will be held in Florence under the Presidency of Professor Grazzi, from the 23d to the 26th of September, 1895. Secretary, Dr. T. Bobone, San Remo. Subjects of discussion :

Treatment of Intra-Cranial Abscesses Following Purulent Diseases of the Ear, Dr. Thomas Barr, Glasgow.

General Treatment in Diseases of the Ear, Dr. Gellè, Paris.

General Treatment in Internal Otitis, Professor Gradenigo, Turin.

Pathological Changes of Labyrinth, Professor Politzer, Vienna.

Physiology of the Middle Ear, Dr. Charles Secchi, Bologne.

NOTES.

At a meeting of the British Laryngological and Rhinological Society, held on January 11, 1895, it was decided, in accordance with the express wish of more than three fourths of the Fellows, to include Otology in the work and title of the Association.

The Committee of the Royal Ear Hospital, London, have decided to appeal for funds to enable them to build a new hospital, the present building being found inadequate. It is the oldest Ear Hospital in existence, having been founded in 1816.

Contents of the last issues of the German Edition of these Archives (*Zeitschrift für Ohrenheilkunde*, No. 4, of vol. xxvi., appearing April, 1895).

A.—ORIGINALS.

1. H. STEINBRÜGGE. Upon Hyperostosis of the Petrous Bone.

2. E. SCHMIEGELOW. Contributions to the Question of the Diagnosis and Treatment of Otitic Brain-Abscesses.

B.—TRANSLATIONS FROM THE ENGLISH EDITION.

C.—REPORT ON THE PROGRESS OF OTOLOGY FOR 1894. (Translated in this number).

D.—BOOK REVIEWS.

(No. 1, of vol. xxvii., appearing May, 1895).

A.—ORIGINALS.

1. H. KNAPP. History and Autopsy of Two Fatal Cases of Otitic Brain-Disease. With two lithographs and one illustration in the text. (Contained in this number.)

2. O. KÖRNER. A New Form of Influenza-Otitis.

3. L. TREITEL. A Case of Multiple Otitic Brain-Abscess, with Statistical Report from the Berlin Pathological Laboratory.

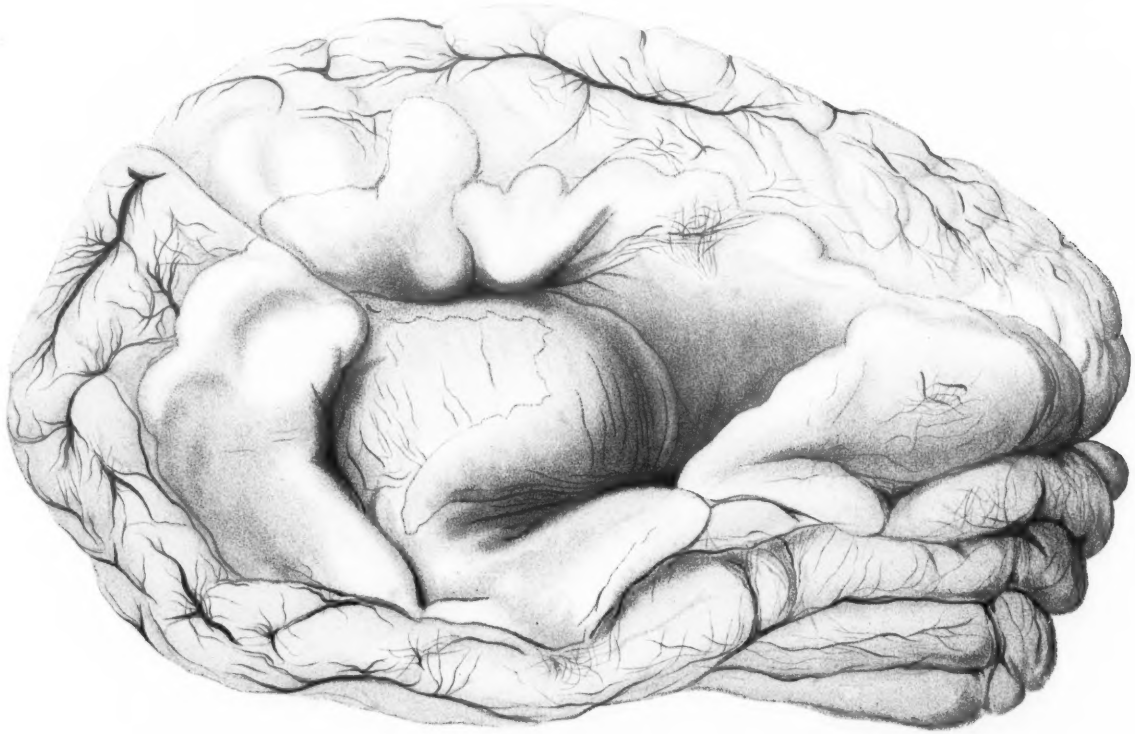
B.—TRANSLATIONS FROM THE ENGLISH EDITION.

C.—REPORT ON THE PROGRESS OF OTOLOGY FOR 1894. (Completed.) (Translated in this number.)

D.—BOOK REVIEWS.

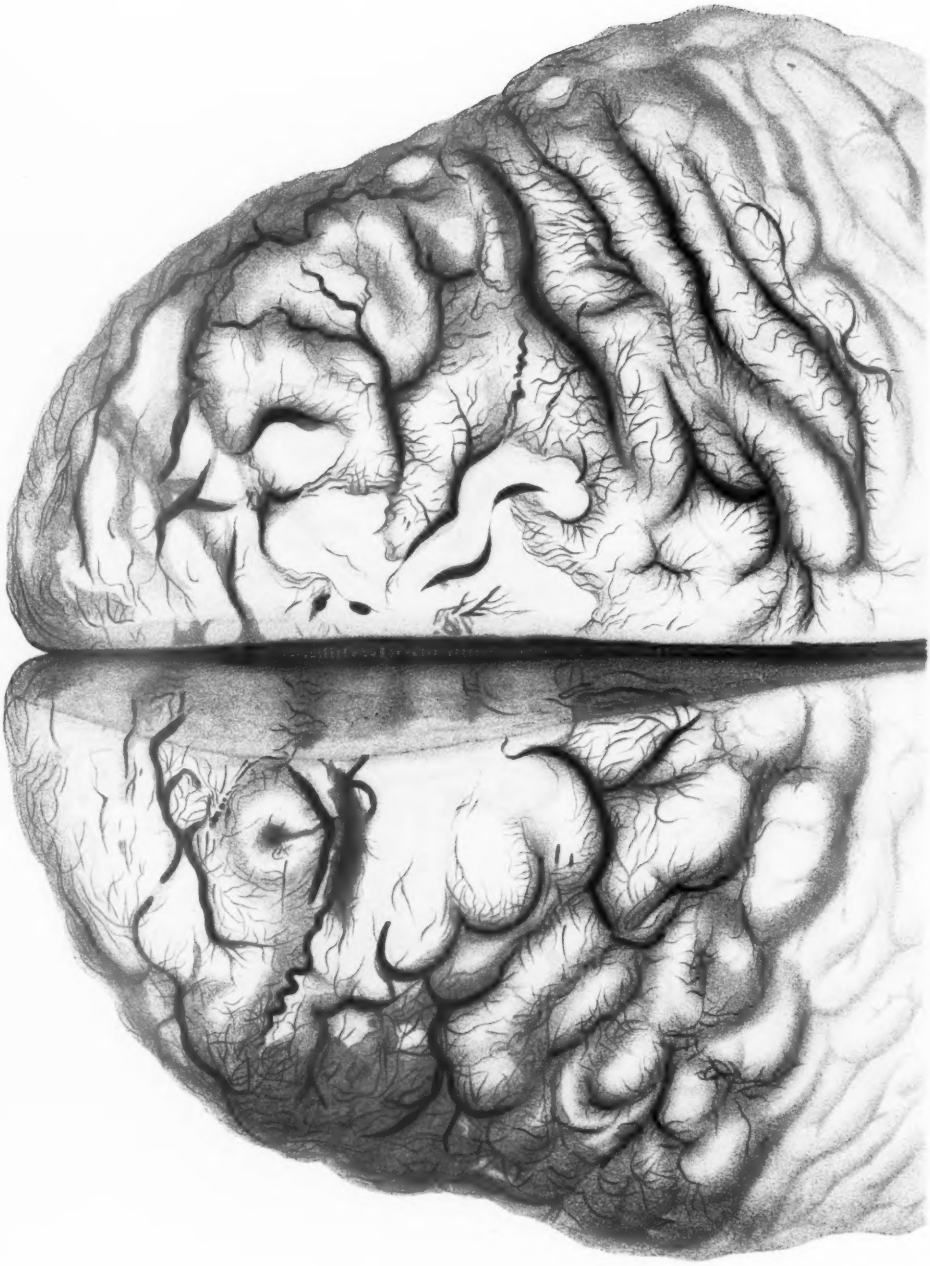
EDITORIAL NOTICE.

The next issue of the ARCHIVES, to conclude the volume, will be a double number, and appear in October.



Lith. Anst. v. Werner & Winter, Frankfurt a. M.

ABSCESS IN LEFT TEMPORO SPHENOIDAL LOBE



Lith. Anst. v. Werner & Winter, Frankfurt a. M.

PURULENT LEPTO-MENINGITIS

NOTICE TO CONTRIBUTORS.

The editors and publishers of the ARCHIVES beg to offer some suggestions to authors who propose to favor them with their contributions.

1. As original communications the ARCHIVES can accept only such papers as have never been printed nor are intended to be printed in other journals. If a preliminary communication on the subject of a paper has been published, the author is requested to state this in the letter accompanying his manuscript. It is understood that contributors to these ARCHIVES and editors of other periodicals will make no abstracts of the original papers published in this journal without giving it due credit for the same.

2. Authors will receive gratuitously twenty-five reprints of their articles. If a greater number is desired,—notice of which should be given at the head of the manuscript,—only the additional cost of presswork and paper will be charged to the author.

3. In preparing manuscript for the compositor it is requested that the following rules be adhered to:

a. Write on one side of the paper only.

b. Write without breaks, *i. e.* do not begin a new sentence on a new line. When you want to begin a new line or paragraph at a given word, place before it in your MS. the sign ¶.

c. Draw a line along the margin of such paragraphs as should be printed in smaller type—for instance, all that is clinical history in reports of cases, etc.

d. Words to be printed in *italics*, should be underscored once, in SMALL CAPITALS twice, in LARGE CAPITALS three times.

4. Authors may receive proofs for revision if they will kindly return them without delay. We beg however to remind our contributors that changes in the copy are equivalent to resetting, causing so much additional expense. We therefore request them, to make, if possible, no alterations at all in their MSS., or, at least, to limit these to what is of essential importance.

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EDITORIAL NOTICE.

IN place of the late Professor Moos, Dr. OTTO KOERNER, Professor of Otology at the University of Rostock, and Dr. ARTHUR HARTMANN, of Berlin, enter into the editorial staff of these ARCHIVES, Dr. KOERNER taking charge of the Original, Dr. HARTMANN of the Reporting, Department of the German Edition. The publication of the ARCHIVES remains unchanged. New subscribers may, on application, receive the portrait in Memoriam of Professor Moos, placed at the head of the present number.

H. KNAPP.
U. PRITCHARD.

Meyers.

Photogravure Meisenbach Riffarth & Co. Berlin.

In Memoriam.

DR. SALOMON MOOS,

The co-founder and co-editor of these ARCHIVES, after a long and painful sickness, died July 15, 1895, on his sixty-fourth birthday. He was a man of unusual talent, extraordinary industry, scrupulous conscientiousness, and extensive general and medical knowledge. Competent and productive in all departments of otology, he cultivated with special zeal its most difficult one, the pathological anatomy of the labyrinth. It was through his own exertions that he rose from a country scholar to the position of a University professor, on whom, in recognition of his merits, his sovereign bestowed the honorable title of Counsellor.

From early youth accustomed to privation and hard labor, he never tired in the discharge of his duty, though for many years he had to struggle with an exhausting disease (diabetes). His example shows that to a career beset with thorns and strewed with stones, the crown of success is not denied.

His scientific achievements as well as his services to this periodical will be spoken of more in detail under the head of "Obituary" at the end of this volume.

HERMAN KNAPP.

New York, July 31, 1895.